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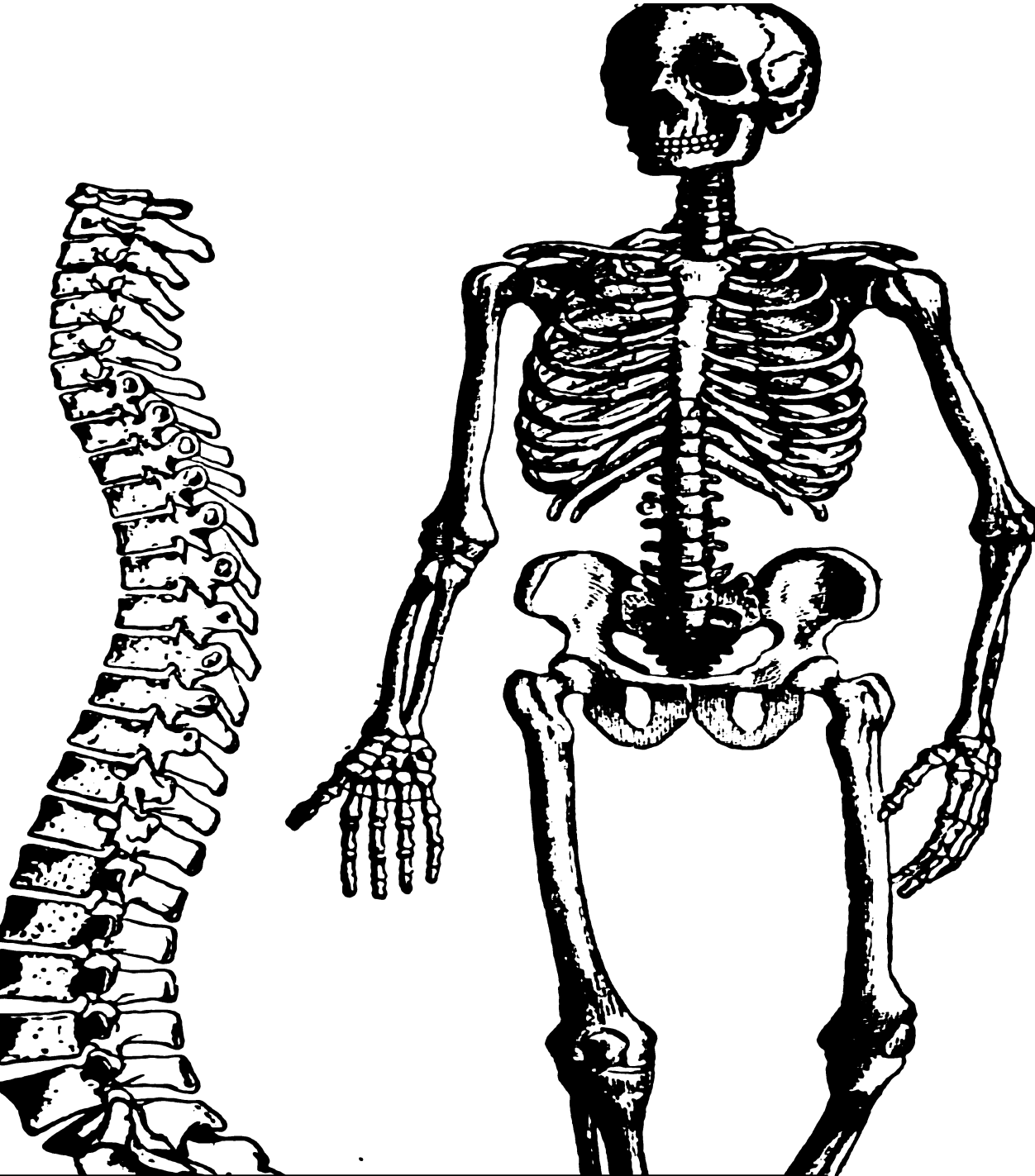
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Neurology and metaphysics

Charles McCormick





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NEUROLOGY AND METAPHYSICS

By CHARLES McCORMICK, M. D.

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the First Non-Sectarian Medical College.
Editor of "The Ophthalmologist."

CHICAGO

1905

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OPTOMETRY

When people are attacked by "acute" diseases they either die or recover quickly; hence such cases are not safe criterions by which to judge systems of practice, whether they be rational or not.

But "chronic" cases, the "incurable" ones of the old schools, afford opportunities to demonstrate the superiority of the drugless methods described in this book.

THE DUALITY SYSTEM

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OPTO

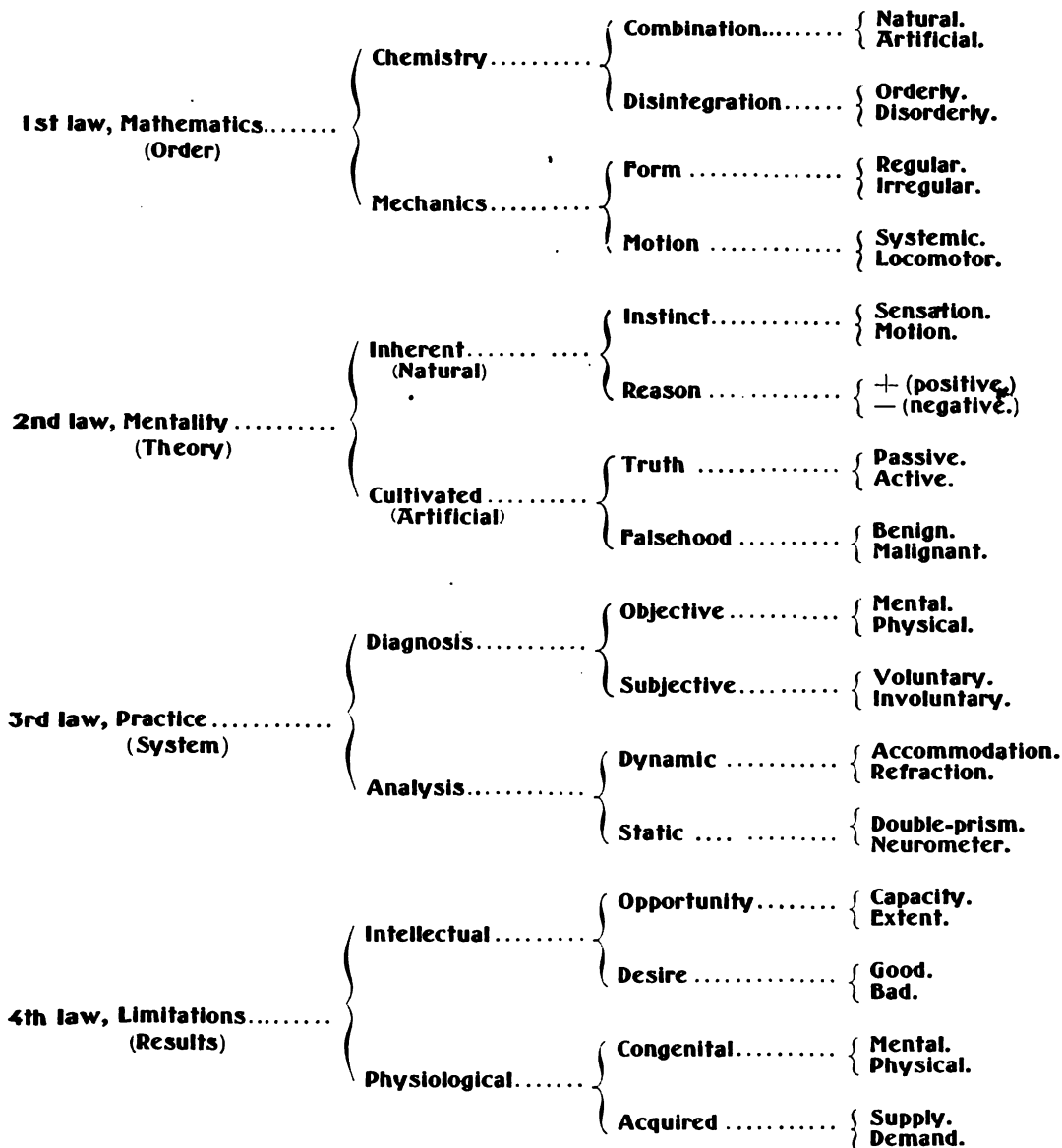
1. Infinite--Creator--Cause.

2. Finite--Created--Effect.

Begin with No. 2 and reason toward No. 1.

Then form ideas and plans for practice.

The proofs of theories are in their fruits.



PREFIXES AND SUFFIXES

PREFIXES.

A-, or an-, or am-, means the same as un-, in-, or im-.
Ana-, up, through, again.
Ant-, or anti-, against, or opposite to.
Apo-, from.
Bi-, two.
Contra-, against.
Dia-, through.
Dys-, difficult, painful, defective.
Ec-, ecto-, or ex-, away from, outside.
Em-, en-, in.
Endo-, ento-, internal.
Entero-, intestine.
Epi-, upon, over.
Extra-, outside.
Gastro-, the stomach.
Haema-, haemo-, or haemeto-, blood.
Hemi-, half.
Hetera-, abnormal.
Hydro-, water.
Hyper-, over, above, beyond.
Hypo-, below.
Hyster-, relating to the womb.
Im-, in-, negative, as impossible or involuntary; it sometimes means within.
Infra-, beneath.
Inter-, between.
Intra-, inside.
Leuco-, white.
Lith-, relating to stone.
Macro-, large, to see with naked eye.
Melano-, pigmentation.
Meso-, middle.
Meta-, with.
Micro-, small, not visible to naked eye.
Mon-, single.
Multi-, many.
Myelo-, referring to brain or spinal cord.
Myo-, muscle.
Neuro-, nerve.

Odonto-, teeth.
Oligo-, lack of.
Ophthalmo-, eye.
Osteo-, bone.
Oxy-, oxygen or acidity.
Para-, through or near.
Peri-, around.
Poly-, many.
Pro-, for, before.
Pseudo-, false.
Pyo-, pus.
Pyr-, or pyro-, fire, inflammation, fever.
Retro-, backward, behind.
Sub-, under.
Super-, or supra-, above.
Sym-, or syn-, together, the same.

SUFFIXES.

-aemia, condition of blood.
-agogue, to carry away.
-agra, an attack.
-algia, pain.
-cele, a hernia or protrusion, tumorous.
-ectomy, to cut.
-graph, to write.
-itis, inflammation.
-logy, discourse.
-malacia, soft.
-mania, madness.
-odynia, pain.
-oid, form.
-oma, tumor.
-opia, relating to condition of eye.
-pathy, relating to diseases and their cure.
-phobia, fear.
-plasty, to form.
-raphy, a suture.
-rhagia, to burst forth.
-rheoa, to flow.
-scopy, to see.
-tomy, to cut.
-uria, referring to urine.

INTRODUCTION

All things are natural or artificial. Those which are artificial have their models in the natural. Study of things may be either science or art. Much of the so-called science of the past has proved very mediocre art. An insatiable desire to be recognized as authority has been the most baneful of mental diseases. Many have reached the goal of their ambitions at a few bounds by way of artful mysteries and assertions which had no foundation in fact, but the ego was satisfied. A credulous few paid homage and the mind that lusted for glory passed from its habitation of clay the subject of a flattering obituary—then oblivion.

Fortunately or unfortunately, according to the point of view, there are two things I have never aspired to: glory and riches. I have seen heroes created, then crucified. I have noted lives devoted to accumulating lucre in payment for sacrificing nearly all natural attributes. I can see nothing in it all.

The two greatest humbugs of the ages have been and are religion and medicine. Neither is natural; both are artificial. True they must have their originals in Nature, but both have been so distorted by would-be authorities that Nature could not recognize the imitations. The first created gods and devils and consigned souls to the devils to appease the alleged wrath of the gods. The second, an offshoot of the first, began by treating ills with incantations and blood-letting and has reached the stage of inoculating well people with deadly viruses and the body politic with venal practice acts, thus creating diseases, mental and physiological, which are appalling to thinking people. The purpose of this book is to strike both and hit hard.

EASE AND DISEASE.

The True Definition of the Last Named. It is a Much Abused Word in the Old Schools.

Disease is the effect of a departure from normal of one or more functions. Therefore, in one sense, it is a natural product. The causes of the changes are as varied as the symptoms exhibited. There are mental diseases and physiological ones. It is as impossible to possess an unhealthy mind and have a healthy body as it is for a healthy mind to remain so in a diseased body. Why is this true? Because Nature is a mental and physical demonstration of perfection, of harmony, of ease. How do we know? We reason, rightly or wrongly; then we assert what we believe, which sets others to thinking, usually antagonistically, and combined reasonings finally develop the truth, or prove the correctness of the original expression. We judge by effects and we study the natural by the artificial means at hand. Effects are the fruit of causes. We reason from effect to cause. We practice from cause to effect. When we attempt to invent causes,

supplant the natural means within our reach by substitution of artificial devices we are liable to err. I do not mean that the artificial is never good, but I do mean that when employed it should comply with natural laws as far as possible; and, unless the user understands the principles of those laws, whatever success follows is accidental.

Man is a product of natural laws and by natural laws he passes through evolutions, good and bad, hence he and his conditions have been set down as natural. When he is well, that is natural; when he is sick, that is natural, too. If he is normal, it is in accord with natural laws that he should be; but if his condition is abnormal it is evidence that some law of Nature has been violated and it is consistent with law that disintegration should begin. Nature's laws are dual, positive and negative; order and disorder; good and evil; health and disease. If you have a machine of many parts, made to perform certain work, and you remove a portion, the machine may continue to do its work, but it cannot do it so perfectly, unless the part was not necessary to carry out the principle. Man may create such machines, but it is inconsistent with infinite perfection to conceive that Nature could or would make such a mistake. The bad effects of a surgical operation may be so much less, considered on the whole, than the good resulting from the removal of a diseased part that the patient and surgeon are enthusiastic. This is because both judged by the relief from pain and the possible prolongation of temporal life. Both lose, or never had, the sense of perfection from Nature's view point. The patient is not intact and is, therefore, more liable to other disorders.

Theism and medicine have always been as nearly identical as the principles of the first could be made applicable to the practice of the second, so that when you tread on the toes of one the other resents it; or, if you tickle one the other laughs. Both have had orthodox dogmas and both have had their heretics. At first the theists put the dissenters to death, but when they became so numerous that such proceedings incited revolutionary symptoms the so-called "irrevocable laws" were modified and the revolution became an evolution—a distinction without a difference. Then there occurred other dissenters from the original ones and even in the new century we have records of heresy trials, excommunications, etc. The medical division, dealing with a more tangible subject, has its orthodox set, but, having no "divine" or "apostolic" head, all want to be popes, hence pandemonium reigns. All are more or less heretical. Codes nor dogmas, nor laws, nor supreme court decisions can hold us in line. The voice of the people is the voice of Nature calling for something better; for closer adherence to her laws; for better understanding; for the simpler therapeutics. The wise physician no longer dares give evasive replies to the questions of his intelligent patients. There are few wise ones, which accounts for the turn of the tide of patronage to new and more rational methods. The

old priests and old doctors have required their flocks to accept too much on faith that failed to work out satisfactorily, and the truth is dawning on the laity that their leaders have not been explaining because they could not. What an age of books and reason and freedom of thought and expression did for the theists it is doing now for the medics, and it will be only a short time until their "inviolable laws" will be modified, repealed, banished, ridiculed into oblivion along with mercury, vaccination and their ilk, and natural methods will prevail. The intelligent public will dismiss its self-constituted conservators and choose its own doctors.

Superstition has always been propagated by church and doctor. The edicts have gone forth that you may violate the moral code and be forgiven times without number—if you belong to the chosen and pay your dues; or, you may violate Nature's laws with impunity if you will patronize the orthodox doctor who has one hundred and ninety-five different prescriptions for "skin diseases," according to "Saunders' Formulary," and the same proportion for other diseases; yet he tells you that orthodox medicine is a science and anyone who disputes him is a "charlatan." A fool public believed it for a long time, and many do now. When they are well they pretend to have little use for medicine, but let them become ill with a simple cold and they imagine all sorts of possibilities. If some sensible, practical person suggests they go to bed, eat lightly and see to it that the nerve supply is not overtaxed, they are insulted and send for the doctor who will give medicine. It is so much easier to take medicine and trust to luck than it is to assume the responsibility of caring for one's own body. If, under the circumstances, there is recovery, the doctor and the medicine get the credit—to such people the fact that they recover is proof positive the two agencies named did it and the doctor grows to believe it himself. When one dies the church man comes to the rescue with his, "The Lord giveth and the Lord taketh away; blessed be the name of the Lord;" and the doctor points with pride to the fact that the mortality in his practice is very low. Of course it is. Few of his doses are lethal and Nature works the case out in spite of them. I have been studying orthodox religions and medicine for thirty years and comparing them with Nature, with the result that I have less use for them each succeeding day. My antipathy is all the more intense because of their cowardly intolerance of rational methods and because I meet, every day, those who are under the blighting influence of dogmas and of opium and other drugs—many of them ministers and physicians, too.

Some one will ask: "Are there no cases in which medicine is useful?" I have no positive proof that there are. I have seen cases, apparently in death's grasp, to which medicine was given and they recovered. But I have also seen cases, pronounced absolutely hopeless by a consultation of eminent orthodox doctors, in which the "faith cure" was employed and

the patient recovered. To me there is exactly the same proof that faith did the curing in one case that there is that medicine did it in the other. And, by the same token the doctor ridicules the faith cure I could ridicule the drug cure. I do neither, however. I tell the truth. I do not know. When it comes to the point where rational methods are impracticable, as in the case of acute attacks such that the patient is unfit to receive instructions and care for himself, I am perfectly willing the other methods be employed. The drug doctors are not so liberal and the faith curists are equally stubborn.

That drug doctors have not supplanted the methods employed by the old prophets, Christ and his apostles, is proved by the fact that nearly all medical practice acts exempt "those who heal by mental or spiritual means." Superstition still obtains to that extent anyhow, and both the protected factions, while berating each other, unite in a duet against new and rational systems. It is a disgraceful fact that courts will uphold alleged laws in the face of the utter failure of both drugs and faith to relieve those chronic ills from which eighty-five per cent. of all people suffer more or less. Justice is blinded by prejudice, unpardonable ignorance or boodles, hence only knows juggled mortuary statistics.

The dead are beyond the reach of courts or healers, many of them killed by the old-school doctors, (a fact generally known and freely admitted by the doctors themselves); none by the faith healers. It is in behalf of the unfortunate among the living that I enter my protest. I urge them to rise in their might of numbers and demand that legislators cease trafficking in public health and repeal the practice acts which seek to make criminals of honest men and women who propose new methods which employ neither drugs nor faith in their application. No crime is so great as that perpetrated by the state against its own when it legalizes and gives a monopoly to systems which have been failures and which seek to force people to suffer themselves to be inoculated with one disease to prevent (!) another.

Drugs and operations have to shoulder the responsibility for the weakened bodies that are the spawning grounds for disease. No castrated woman is as able to withstand the inroads of time like she who has all her organs intact; and if it were the law that when a surgeon has so treated ten women he should suffer the same operation none would ever reach his tenth case. No man who has had his abdomen opened ever became the same in health as before; he may live and might have died if the operation had not been performed, but when my surgeon acquaintance have told me the majority of operations are for the fee incident thereto, I am forced to believe them, (for who would joke on so serious a subject), and to express my abhorrence of such a way of getting money.

A body with subnormal parts which require an extraordinary effort

of the nervous system to maintain the proper functional operation is no more amenable to the faith cure than it is to drugs, and neither faith healer or drug doctor knows how to reach such cases. The following pages will prove this assertion, make others and prove them, and incidentally, teach as much of the rational system as is possible for me outside of personal instruction.. Of course reasonable people know there is but one sure way to get all the ideas of another, and the details of the principles upon which he works.

IMPOTENCE OF OLD METHODS.

Testimony of Doctors Who Have Been and Are Recognized Generally as Leaders of Thought in Orthodox Ranks.

This work would not be begun properly without introducing the confessions of eminent old-school doctors, which are commended to legislators and executives who have to meet and act upon demands for "protection" of the dear people, or, in other words, class legislation in favor of the medical trust.

The originators of the practices denounced in these confessions, yet practiced by the confessors, took the following oath before entering practice.

"I swear not to malign any of my former masters, physicians, pharmacists, or others, whoever they may be; to uphold as far as in me lies the honor, glory, ornament, and majesty of medicine; not to disclose to idiots and ingrates their secrets and mysteries; to do nothing rashly, without the counsel of physicians or in the hope of gain; to disown and to avoid like the plague the disreputable and entirely pernicious methods of practice now followed by charlatans, empirics, and dabblers in alchemy, to the great disgrace of the magistrates who tolerate them. May the Lord prosper me as I observe these conditions."

The code of ethics, promulgated in 1904 by the American Medical Association, and copyrighted by that august body, charges its votaries to "maintain an air of peculiar reserve toward the public." The confessions follow:

Dr. Ramage, F. R. C. S., London: "It cannot be denied that the present system of medicine is a burning shame to its professors—if indeed a series of vague and uncertain incongruities deserves to be called by that name. How rarely do our medicines do good! How often do they make our patients really worse! I fearlessly assert that in most cases the sufferer would be safer without a physician than with one. I have seen enough of the malpractice of my professional brethren to warrant the strong language I employ."

Prof. O. Rosenbach, Berlin: "The history of medicine teaches us that any and every method of treatment has always been followed by a method based on exactly opposite principles; and it further demonstrates that all these differences have been upheld by fanatic adherents with the same

fervor, under cover of equally good statistics, so that as a matter of fact every form of treatment, at least in the opinion of its chief supporters, may justly claim identical value as to efficacy and healing virtues."

Dr. Evans, F. R. C. P., London: "The popular medical system is a most uncertain and unsatisfactory system. It has neither philosophy nor common sense to commend it to confidence."

Sir John Forbes, Fellow of the Royal College of Physicians, London, and physician to the Queen's household, said, "No systematic or theoretical classification of diseases or therapeutic agents ever yet promulgated is true, or anything like truth, and none can be adopted as a safe guidance in practice."

Prof. A. H. Stevens: "The older physicians grow, the more skeptical they become of the virtues of medicine, and the more they are disposed to trust to the powers of Nature."

Prof. Gregory, of the Edinburgh Medical College, said to his medical class, "Gentlemen, ninety-nine out of every one hundred medical facts are medical lies, and medical doctrines are, for the most part, stark, staring nonsense."

Dr. Alonzo Clark: "Every dose of medicine diminishes the patient's vitality. In their zeal to do good, physicians have done much harm. They have hurried thousands to the grave who would have recovered if left to Nature."

John Mason Good, M. D., F. R. S., London: "The science of medicine is a barbarous jargon. My experience with *materia medica* has proved it the baseless fabric of a dream, its theory pernicious, and the way out of it the only interesting passage it contains. The effects of medicine on the human system are, in the highest degree, uncertain, except, indeed, that they have destroyed more lives than war, pestilence and famine combined."

Dr. Jacob Bigelow, formerly president of the Massachusetts Medical Society, says: "The premature death of medical men brings with it the humiliating conclusion that medicine is still an ineffectual speculation."

Dr. Cogswell, Boston: "It is my firm belief that the prevailing mode of practice is productive of vastly more evil than good, and were it absolutely abolished, mankind would be infinitely the gainer."

Dr. Abercrombie, Fellow of the Royal College of Physicians of Edinburgh, says: "Medicine has been called by philosophers the art of conjecturing; the science of guessing."

Prof. Jamison, Edinburgh: "Nine times out of ten our miscalled remedies are absolutely injurious to our patients, suffering from diseases of whose real character and real cause we are most culpably ignorant."

Prof. Henle, the great German pathologist and teacher, says: "Medical

science, at all times, has been a medley of empirically acquired facts and theoretical observations, and is so likely to remain."

Dr. Eliphalet Kimball: "There is a doctorcraft as well as priestcraft. Physicians have slain more than war. The public would be better off without professed physicians."

Prof. Valentine Mott, the great surgeon, says: "Of all sciences, medicine is the most uncertain."

Prof. B. F. Parker: "Instead of investigating for themselves, medical men copy the errors of their predecessors, and have thus retarded the progress of medical science and perpetuated error."

Sir Astley Cooper, the famous English surgeon, says: "The science of medicine is founded on conjecture, and improved by murder."

Marshall Hall: "Let us no longer wonder at the lamentable want of success which marks our practice, when there is scarcely a sound physiological principle among us."

James Johnson, F. R. S.: "I declare as my conscientious convictions, founded on long experience and reflection, that if there was not a single physician, surgeon, man-midwife, chemist, apothecary, druggist nor drug on the face of the earth, there would be less sickness and less mortality than now prevails."

Dr. Alexander M. Ross, Fellow of the Royal Society of England, member of the Colleges of Physicians and Surgeons of Quebec and Ontario, Professor of Hygiene and Sanitation at the St. Louis Hygienic College of Physicians and Surgeons, Vice-President of the Association of Hygienists of America, Member of the Ninth Session of the International Medical Congress, Member of the British, French, and American Association for the Advancement of Science, etc., etc., says: "I charge that they have encouraged superstition and humbug by the germ theory of disease. I do not question the existence of infinitesimal micro-organisms; but they are the result, not the cause of disease. They are the scavengers; their legitimate work is to clean out the sewers of our bodies. Wherever there is decay, pus or decomposing matter these little life-savers are doing their work of neutralization, sanitation and purification. They feast upon effete and decaying animal matter. They are beneficial helpers to an important end."

H. C. Wood: "What has clinical therapeutics established permanently? Scarcely anything."

Dr. Oliver Wendell Holmes: "Mankind has been drugged to death, and the world would be better off if the contents of every apothecary shop were emptied into the sea, though the consequences to the fishes would be lamentable."

Dr. Talmage, F. R. C. S.: "I fearlessly assert that in most cases our patients would be safer without a physician than with one."

Dr. Cyrus Edson: "After all has been said, it must be admitted that

a proper observance of the rules of personal and public hygiene on the part of every individual belonging to the civilized world would do more to effect a reduction of the death rate and prolong the average duration of life than any discovery in the cure of diseases that at present seems within the bounds of possibility."

Dr. Horace Green: "The confidence you have in medicine will be dissipated by experience in treating disease."

Dr. Benj. Rush: "The art of healing is like an unroofed temple—uncovered at the top and cracked at the foundation. I am incessantly led to make apology for the instability of the theories and practice of physic. Dissections daily convince us of our ignorance of disease, and cause us to blush at our prescription. What mischief have we not done under the belief of false facts and false theories? We have assisted in multiplying diseases; we have done more, we have increased their fatality."

Dr. A. C. Bernays: "Ninety-five out of every hundred patients who apply at a doctor's office to be treated would get well anyway, if left to Nature."

Prof. Magendie: "Medicine is a great humbug. I know it is called a science—science, indeed! It is nothing like science. Doctors are mere empirics when they are not charlatans. We are as ignorant as man can be. Who knows anything in the world about medicine? I know nothing in the world about medicine, and I don't know anybody who does know anything about it. I hesitate not to declare, that so gross is our ignorance of the real nature of the physiological disorders, called disease, that it would perhaps be better to do nothing and resign the complaint we are called upon to treat to the resources of Nature than to act, as we are frequently called upon to do, without knowing the why and the wherefore of our conduct and its obvious risk of hastening the end of the patient."

In the face of this testimony who dares say it is not an outrage upon the rights of the people to attempt to restrict their opportunities for treatment and instruction to a medico-political trust? The so-called medical laws on the statute books are frauds of the most malignant kind. They are clearly contrary to the constitution of the United States, which declares: "The rights of the people shall not be abridged." These alleged laws should be repealed, or the constitution amended. Every person who undertakes to treat human ills should be held accountable for the results. If he or she takes risks without the patient's full knowledge and consent, or without securing advice from colleagues, and evil results follow, the penalty should be the penitentiary. Such a law would protect the people by insuring them against wholesale experiments, such as are practiced daily by the old-school doctors, who boast that they can do anything they please without fear of prosecution.

PHYSICAL PORTION

ANATOMY AND PHYSIOLOGY

From the Brain to the Procreative Organs—A Convenient Recapitulation.

The skeleton includes the osseous system from the bones of the skull to those of the feet, and as all writers agree practically, except as to the number, which varies according to the age of the subject, we will not take up space recounting them here, nor will we enter into the histology of the structure because it is largely microscopic, and this book is dealing with the needs of everyday practice. In Fig. 1, the spine shown separately presents its outside toward the skeleton.

As one of the chief objects of this work is to find fault, it is perfectly consistent to say that the anatomies in vogue with the old schools do not differentiate between the important and the unimportant; hence their students are compelled to master or rather to commit to memory a lot of verbiage which is of no earthly use to them in practice. This chapter is designed to supplant the encyclopedic endeavors of other writers by giving in brief space not only the structure but the relation between the several parts, so that the practitioner or even the layman can acquire a comprehensive knowledge by repeated readings, and for further details he can apply to the old anatomies and physiologies, accepting with grains of allowance many assertions which are accompanied by no proofs.

The head contains the cerebrum or intellectual brain from which all voluntary acts are directed; also the cerebellum, or mechanical brain, which is the storage battery from which is supplied sensory and motive power.

In Fig. 2, showing the left half of a brain, C is the cerebrum; Cb the

cerebellum; P the pons varolii, or bridge connecting the two lateral halves of the cerebrum; M, the medulla oblongata or beginning of the spinal cord. S marks the fissure of Sylvius which carries the principal cerebral arteries.

The connections between the cerebellum and the medulla oblongata are

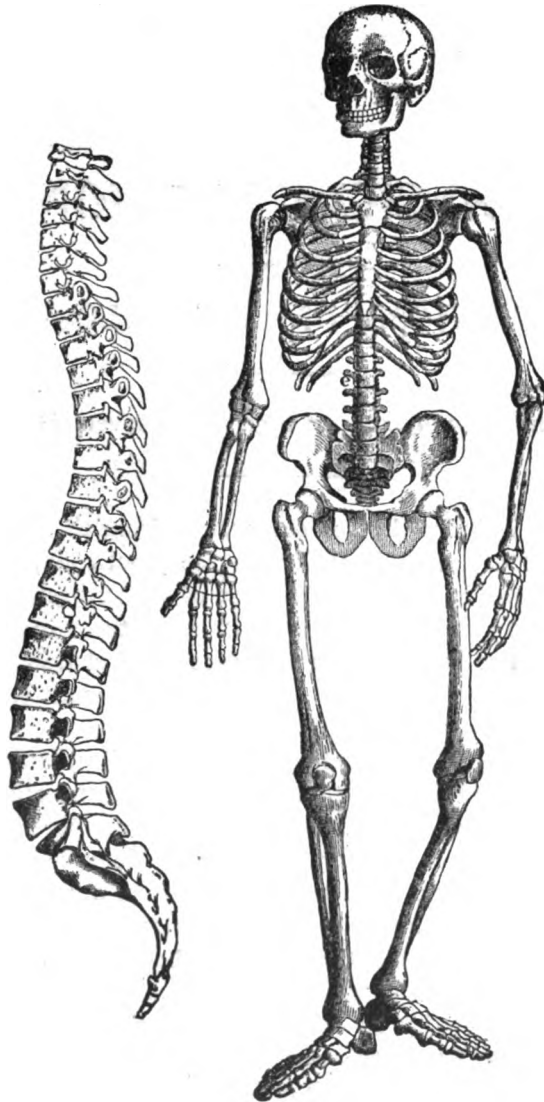


Fig. 1

positive and negative as in all other batteries, and the current is constantly circulating through forty-three pairs of nerves, twelve pairs running direct to special departments and the other thirty-one being distributed by way of the spinal column. Of the twelve pairs of cranial nerves, the first pair,

olfactory, supply the sense of smell; the second, optic, the sense of sight; the third, motor oculi, operate all the eye muscles except two, the external rectus, which is operated by the sixth, and the superior oblique, operated by the fourth; the fifth, trigeminus, meaning three branches, supplies both motion and sensation to the jaws and teeth; the ophthalmic division connects with the third nerves to the eyes; the seventh, portio dura, or trifacial as it is sometimes called, supplies the muscles of the face and some of the muscles of the eyelids, the orbicularis palpebrarum and the tensor tarsi; the eighth, auditory, furnishes the sense of hearing; the ninth, glosso-pharyngeal, affords the sense of taste; some fibres of it connect with the fifth; the tenth, pneumogastric, supplies the lungs, stomach, heart, and their accessories, being assisted by the eleventh, called spinal accessory, and by

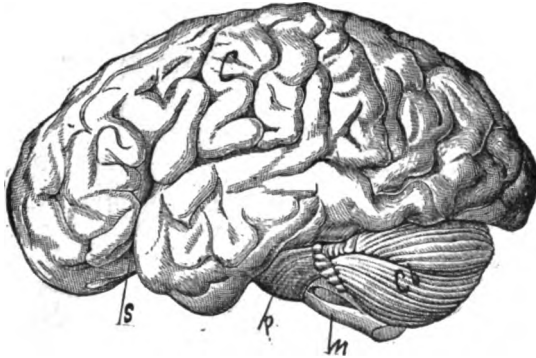


Fig. 2

branches of some of the spinal nerves; the twelfth, hypo-glossal, supplies motion to the tongue. It will be noted that of these twelve pairs, two pairs go to the tongue and four and one-third pairs to the eyes, the only organs in the body so favored. I sometimes remind my patients that if two pairs of nerves to the tongue can make as much trouble as they do sometimes, it is no wonder that so many of our ills have for the primary disturbing element defects of the eyes which have thirty-six per cent of the entire cranial wires and ten per cent of the entire system in the body.

The spinal nerves are not only rights and lefts (see Fig. 3), but they have anterior and posterior branches, and these have other branches which interlock in almost every tissue, so that messages may be sent indirectly as well as directly. This interlocking system is the one over which the involuntary current connects one organ with another and any disturbance in one department will excite sympathetic action in all the others; hence it has been called the sympathetic system. To read the old anatomies one would conceive the idea that the sympathetic was an entirely separate line, which it is not.

A person starts in life with a certain amount of energy stored in the cerebellum, and the molecular action of the body creates some by friction,

while the chemical action upon food adds a certain amount, all of which is conveyed over the wires to the brain from whence it is distributed as needed. The current toward the brain is called afferent, and that from the brain is called efferent. The afferent is really the positive current and efferent the negative, but as we utilize it the efferent takes the positive form

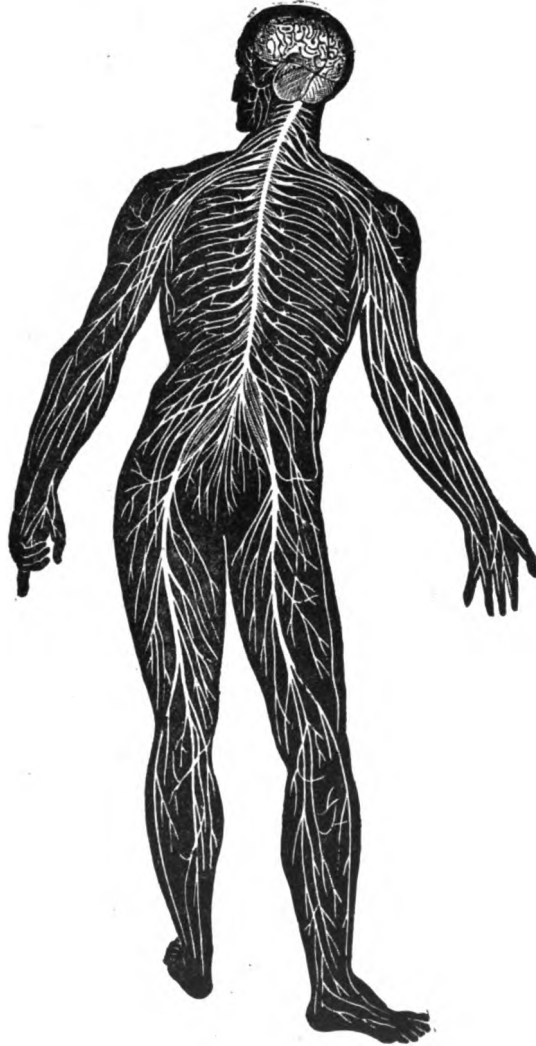


Fig. 3

when applied too vigorously, thus producing spasms, irritation and fever, because the two functions of the nervous system are sensation and motion, sensation being exhibited in the special senses and in the warmth of the body, while the motive power is exhibited in the musculo-motor nerves and vaso-motor nerves, the latter working the blood-vessels and lymphatics and

other tubular systems of the body, such as the esophagus and intestines. It sometimes exhibits inability to perform the duties required, as illustrated in fainting and general debility. The idea of giving stimulants to a depleted nervous system is as abhorrent to us as it would be to require hard manual labor from a sick man.

The brain is subject to the influence of these positive or negative exhibits, no matter where they occur, because the various offices in the cerebrum, termed the "faculties" by phrenologists, are highly sensitive, not only to mental disturbances from within or without, but to any physical obstruction. The cerebellum is subject only to physical disturbances such as blood clots, which produce apoplexy, and lack of blood, which produces paresis from want of nourishment to the nervous system. Of course when the mechanical brain is not acting perfectly the intellectual one will be deficient, but this effect on the cerebrum from the cerebellum is indirect rather than direct, and it affords one of the best proofs that all doctors should disseminate information to the public in comprehensive language so that it may apply to them for consultation and advice as a matter of prevention rather than of cure. The doctor should constantly picture ideal states so that all may compare themselves therewith and see wherein they are lacking. The first objection that we hear to this proposition is "will not the doctor run himself out of business?" I answer "Not in your life. There are too many fools in the world who will continue to believe in the curative abilities of the doctors, no matter how loudly they disclaim it. Some will reap great benefits and they will send others to the doctor who seems to know his business well enough to be able to tell it."

The thoracic cavity in the upper part of the trunk is an air tight space containing the heart and lungs. The heart is simply a quadruple pump with the necessary valves to accomplish its purpose under the inspiration of the lungs, which get their motion from the diaphragm, the large muscle which forms the dividing wall between the thoracic and abdominal cavities. This muscle, of course, gets its impulse through the involuntary current from the brain, but is subject to control, to some extent, by the intellectual department, although it would be difficult for one to hold his breath long enough voluntarily to kill him. The function of the lungs as is well known, is to throw off carbonic acid gas and to impregnate the blood with oxygen gas.

The cause of pulmonary tuberculosis or consumption of the lungs is not what one breathes in, but what is not breathed out. Therefore, the first thing the doctors should teach the public in detail is how to breathe, and one of the principal things is, breathe in through the nose. One may breathe out through the mouth. In Fig. 4, 1 is the larynx; 2, is the trachea or wind-pipe; 3 and 4, are the bronchi; 5 and 5, are air cells; 6 and 6, are the bronchial tubes.

The circulatory system really begins in the lungs, but the old anatomies started it at the heart, naming all vessels which flow from the heart "arteries" and all which flow toward it "veins;" thus by their arrangement the pulmonary artery which carries the bad blood from the right ventricle of the heart into the lungs becomes a paradox, and the pulmonary veins which carry the blood from the lungs to the left auricle of the heart are another paradox, because the word "arteries" refers to aerated blood. The arterial system, then, begins with the aorta which passes upward from the left ventricle of the heart, arches over the left lung and distributes branches as follows: From the arch, the two coronary, right and left, to the muscular tissues of the heart; the innominate, which divides into the right subclavian and right common carotid; the left common carotid, internal and external, eight branches each, to the head; left subclavian, with fifty-four branches,

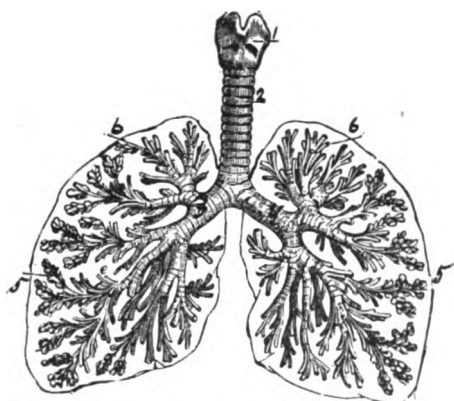


Fig. 4

seven vertebral, three to the thyroid axis, eight interior mammary, two superior intercostal, seven axillary, seven brachial, eight ulnar and twelve radial. In the thoracic cavity the aorta gives off three bronchial to the lungs, four esophagal to the esophagus, connecting with branches of it to the inferior thyroid, phrenic and gastric; two pericardiac to the sac which encloses the heart; twenty intercostal to the ribs, tissues of sides and back, vertebrae and spinal cord; two posterior mediastinal to the glands in the mediastinum; two phrenic, internal and external, to the diaphragm and front and sides of the thorax; one coeliac axis with three branches, the gastric to the stomach; hepatic to the stomach, liver, pancreas and duodenum; splenic to the stomach, pancreas and spleen. Superior mesenteric with five branches to the pancreas, duodenum, mesentery and the intestines. In the abdomen the aorta gives off twenty-two branches: Two supra-renal, right and left, to the supra-renal capsules; two renal, right and left, to the kidneys, ureters and capsules; two spermatic or ovarian to the testes or ovaries; one inferior mesenteric, three branches, to the descending colon, sigmoid flexure and the rectum; eight lumbar, with sixteen branches, to the

muscles of the back, to the abdomen and to the canal of the spine; one middle sacral to the coccyx; two iliacs, right and left common, with forty-two branches, supplying the bladder, precreative organs and lower limbs. The venous system has corresponding vessels to bring the blood back to the heart, all of which flow indirectly and directly into the superior and inferior vena cava, which empty into the right auricle of the heart, thence into the right ventricle, thence to the lungs, thence to the left auricle, thence to the left ventricle the place of beginning.

The venous system is really where the blood originates. The spleen which is attached to the stomach at the left side, takes up certain elements from the food and manufactures the blood in its crude state, then sends it by way of the portal vein, which passes under the stomach to the liver at the right side, it receiving certain additions from the stomach as it goes. The liver extracts the excess of sugar and urea, then sends the blood on through its own vessels which connect with the inferior vena cava, and it goes via the heart to the lungs to be oxygenated before being distributed through the system. From this we know that when the blood lacks the essentials necessary for nourishment it is either because the proper elements did not exist in the food, or they never got into the spleen, or there was too much sugar and urea for the liver to handle properly, or that the nerve supply to the liver was deficient. It follows as naturally as night follows day that the remedy is suggested by the situation.

The right lung has three lobes and weighs twenty-two ounces; the left has two lobes and weighs twenty ounces. The reason the right lung is largest is because most of the heart is on the left side and the aorta occupies a good deal of space. The capacity of the lungs is only limited by the capacity of the cavity containing them, and this may be increased by proper exercise, but it should always be done under the direction of one who understands how to do it safely.

The heart is a muscular organ 5 x 3 1-2 x 2 1-2 inches, lies diagonally, base up, apex down and to the left, in the front part of the thoracic cavity, and the reason we hear it beat is that it strikes against the walls. It weighs from eight to twelve ounces and pumps about sixteen tons of blood daily. Whenever it seems to be weak it is not in itself, but in the power that operates it, which is easily proved by lying down so that the pumping is done on a level instead of up-hill, when it does not require so much force. Weak hearts always mean a weak nerve supply in the cerebellum. It is possible that there are occasional valvular derangements, but they are exceedingly rare, although the old school doctors charge all weak hearts to the valves.

The abdominal cavity contains practically all the other organs, in the following order:

The stomach, 13 x 5 x 3 1-2 inches, a muscular organ with glands which

secrete and extract juices which it works into the food, so that disintegration is both a chemical and mechanical process. Overloading interferes with the mechanical workings, and improper food, with the chemical workings, so it is obvious both must be understood. The stomach weighs, empty, from four to five ounces. Its capacity is from three to five pints, depending upon the size of the person and how it has been treated. It secretes from six to eight pints of gastric juices daily when in normal working order.

The spleen is enclosed in the same folds of the peritoneum with the stomach, and fits around the left end of that organ, being connected by a vascular system and serous walls. It has a capacity of from six to ten ounces, and is one of the four ductless glands in the body, that is, it is neither a secretory nor an excretory organ in the sense that many others are. It simply gathers up certain elements and passes them on to the liver as crude blood.

The duodenum or second stomach receives food from the stomach through the pylorus, and here is where digestion and assimilation of food is said by the old authorities to begin. It is about ten inches long and curves something like a shepherd's crook laid on its side, running a little upward to the right from the pyloric opening about three inches until it strikes the liver, then curves downward about three inches, then to the left about four inches under the stomach, where it connects with the jejunum or first section of the small intestines. It receives its juices from the pancreas and gall bladder.

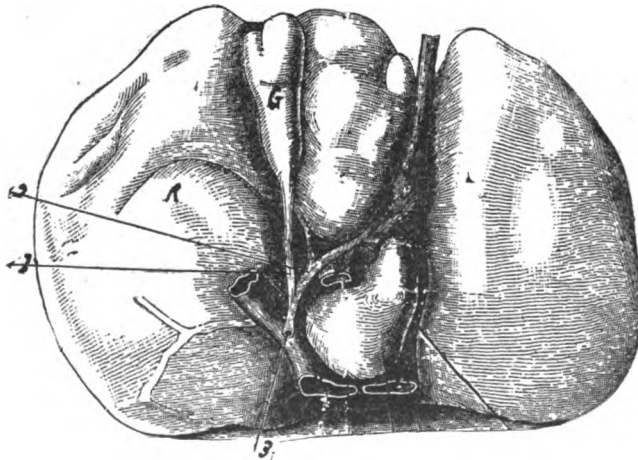


Fig. 5

The liver, 12 x 6 x 3 inches, is the largest gland in the body, weighs the same as the brain, secretes from twenty to forty ounces of bile in twenty-four hours, excretes sugar and urea, preventing kidney troubles and auto-intoxication or blood-poisoning from within. If it fails to do its

duty for any reason, the only other organ that undertakes the job is the kidneys; hence it follows that when we find kidney troubles we must begin by treating the liver to a rest and such foods as have little sugar or starch in them. Fig. 5 shows a view of the liver from below: R, right, L, left lobes; V, inferior vena cava; H, hepatic vein; P, portal vein; G, gall bladder; 1, gall duct; 2, hepatic duct; 3, bile duct.

The pancreas, $7 \times 2 \times 1$ inches, lies just behind the stomach and liver, weighs about three ounces, and secretes twenty ounces of pancreatic juice in twenty-four hours and delivers it to the duodenum.

The gall-bladder, $3 \times 1 \frac{1}{2}$ inches, is attached to the lower side of the liver, has a capacity of about one ounce, but handles from twenty to twenty-four ounces daily, delivering it to the duodenum.

The kidneys, situated in the lumbar region, $4 \times 2 \frac{1}{2} \times 1 \frac{1}{2}$ inches, weigh about five ounces each, capacity from forty to fifty ounces in twenty-four hours, in which there is about $1 \frac{1}{2}$ ounces solids and from three hundred to five hundred grains of urea, one grain of uric acid to thirty-three

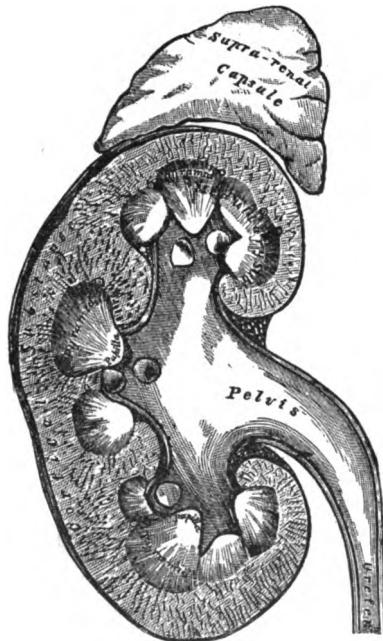


Fig. 6

grains of urea normally—more is bad. Fig. 6 shows kidney bisected vertically. The left kidney is higher than the right because of the size and location of the liver. The kidneys are outside of the peritoneum, the muscular lining of the abdomen which encloses nearly all of the viscera, and are held in place between it and the wall of the trunk by it. In great weakness it collapses and we have "floating kidney."

The supra-renal capsules, 1 1-2 x 2 inches, weigh about 1-16 ounce each, are located on top of each kidney, see Fig 6, and either extract toxics from the blood or supply a natural antitoxin. They are such vital organs that if removed death ensues in a short time from blood-poisoning. The alleged scientists of the old school have experimented with supra-renal extracts as antitoxins for diphtheria and other troubles until they have killed more people than the diseases ever did.

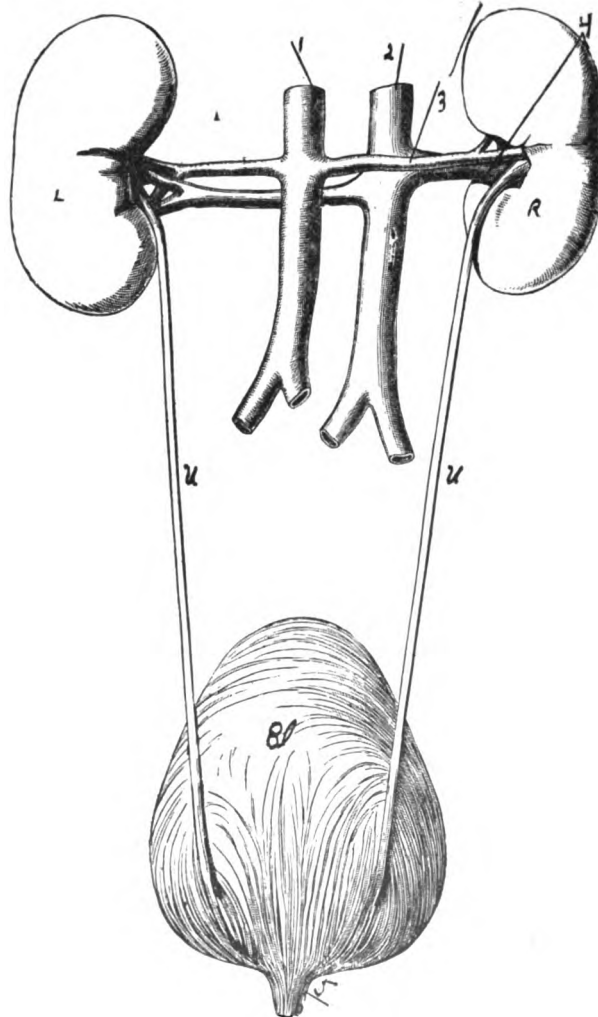


Fig. 7

The bladder, 5 x 3 x 5 inches, capacity about a pint, connected with the kidneys by long tubes called ureters. The liver, kidneys, ureters and bladder are subject to calculi or stone formations, none of which could form if the liver was not overtaxed, quantitatively or qualitatively by that which passes through it. Fig. 7 shows the kidneys and bladder and their con-

nections, from behind. R, right, L, left kidney; U U, ureters; Bl, bladder; 1, aorta; 2, inferior vena cava; 3, right renal artery; 4, right renal vein; 5, neck of bladder.

The mesentery comprises a double fold of the peritoneum, about four inches wide, extending nearly the whole length of the intestines, connecting them loosely with the spinal column. It contains many blood vessels, nerves, lacteals and lymphatics. Its glands connect with the lymphatico-lacteal system as well as with the blood vessels, hence it is regarded as the great organ of assimilation.

The intestines. From the duodenum there is the jejunum, eight feet, and the ileum, eleven feet, which constitute the small intestines; then the caecum, a pouch about 2 x 3 inches in the lower right side, to which is attached the vermiform appendix and out of which arises the colon or large

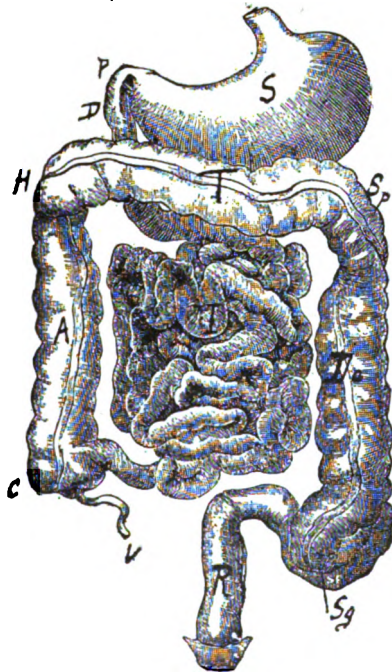


Fig. 8

intestine, which is five feet long, extends straight up almost to the liver, and is called the ascending colon, then it makes a turn called the hepatic flexure, passes transversely to the left, makes a turn called the splenic flexure, then descends on the left side in front, where it makes a turn backward and twisted about like the letter "f," called the sigmoid flexure, and connects with the rectum, which is about five inches long. The capacity of the colon, ascending, transverse and descending, is about a gallon. In Fig. 8, S, is the stomach; P, the pylorus or opening into D, the duodenum; I, the small intestines; C, caecum; A, ascending

colon; H, hepatic flexure; T, transverse colon; Sp, splenic flexure; Dc, descending colon; Sg, sigmoid flexure; R, rectum; V, vermiform appendix.

The alimentary canal begins at the mouth, includes the pharynx, esophagus, stomach, duodenum, jejunum, ileum, caecum, colon, rectum. The whole is lined with a delicate membrane, which is an internal skin, endowed with secretory glands that keep it lubricated from one end to the other if in a proper state of health. Fig. 9 shows: 1, mouth; 2, nasal passage; from these two canals lead to L, lungs, and S, stomach, the latter continuing on to the anus; Cb, is the cerebellum; VV, vertebrae; Sp, the neural space; H, heart, K, kidneys.

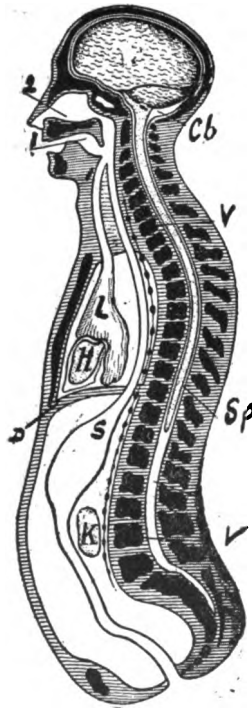


Fig. 9

The generative organs are important, because, not only is a healthy condition thereof necessary to the correct performance of the procreative function, but their abuse from ignorance is one of the greatest causes of both mental and physical ills.

In these, as in all other branches of our work, there are + and —; the male organs are positive and the female negative, yet each has positive and negative elements.

In the male the testicles are of glandular structure called semeniferous tubules, of which there are several hundred; they secrete a fluid which is started on its journey through the epididymis, a duct about twenty feet long when unwound; from this it passes into the vas deferens, another duct

about two feet long, which connects the other with the vesiculæ seminales, two reservoirs each about one and one-half inches long, situated on the inner or posterior surface of the bladder at its base, where the fluid is stored. The ejaculatory duct, about three-fourths inch long is formed by the ducts of the vesicles and the vas deferens; it enters the urethra along with the tubules from the prostatic gland, $1\frac{1}{2} \times 1 \times 3\frac{1}{4}$ inches, which surrounds the posterior end and supplies the elements which vitalize the semen.

In the female the vagina is the cavity between the bladder and rectum, about six inches long, containing the uterus or womb, $3 \times 2 \times 1$ inches; at



Fig. 10

its base, which is above, the uterus connects with the fallopian tubes, each about 5 inches long and $1\frac{1}{10}$ inch calibre, which connect with the tubes

from the ovaries at their extremities. Each ovary is about $1\frac{1}{2} \times 3\frac{1}{4} \times 1\frac{1}{3}$ inch in size, and weighs half an ounce; in these are the Graafian vesicles which vary in size from $\frac{1}{8}$ to $\frac{1}{6}$ inch and contain ova or eggs. There are many thousands of these vesicles in each ovary. The ova are about $\frac{1}{120}$ inch diameter.

In females there is a pseudo prostatic gland surrounding the neck of the bladder; it lacks the male essentials, but is a ring of muscular tissue well supplied with nerves, and, being a sphincter muscle is often involved in spasms from irritation of the nervous system, causing stubborn bladder troubles which old school methods have failed to treat successfully. See chapter on alleged diseases of women.

There are several hundreds muscles, but Fig. 10 shows the principal ones and tells a very pretty story that needs no supplement in this work.

THE EYES AS DOUBLE GAUGES.

The Neurologist Measures the Nerve and Blood Supplies Through Them.

What would a steam boiler be worth without steam and water gauges? What would an electric plant be worth with no means to measure voltage and amperage? What would either be worth without someone in charge who possessed an understanding, not only of what they are for and how to use them, but how to protect them from abuse, how to test them to see if they register correctly, and fix them if they do not?

The eyes are to the human body what the gauges are to boilers and electric plants. With an ophthalmoscope the doctor who knows how can look inside the eyes and observe both the arterial and venous systems, note the quality and quantity of the blood, thus learning what the blood-making and purifying organs are doing without inconvenience to his patient. There are many other things he may learn, too, as will be shown under the proper headings further along in this work. Few oculists, scarcely any physicians and no faith healers know the value of this simple little instrument. So simple, indeed, that an ordinary lens with one side plane, or slightly concave, is a very practical ophthalmoscope. The eyes are therefore, the blood gauges of the body.

The doctor who knows how can apply dynamic and static tests through the eyes and measure the amount of the nerve supply just as perfectly as the steam gauge or amperemeter tells the pressure of steam or the quantity of electricity being consumed each day, hour or minute. Thus the eyes are the steam gauges and amperemeters of the body. No doctors, excepting my own pupils, have known this because I was the fortunate person who discovered it. I have compiled data, tables, etc., and named them "The Neurometer" (nerve measure). They will be found in the regular order of my story, and those who master them will find them so accurate that after a complete examination they can figure, very closely, the patient's

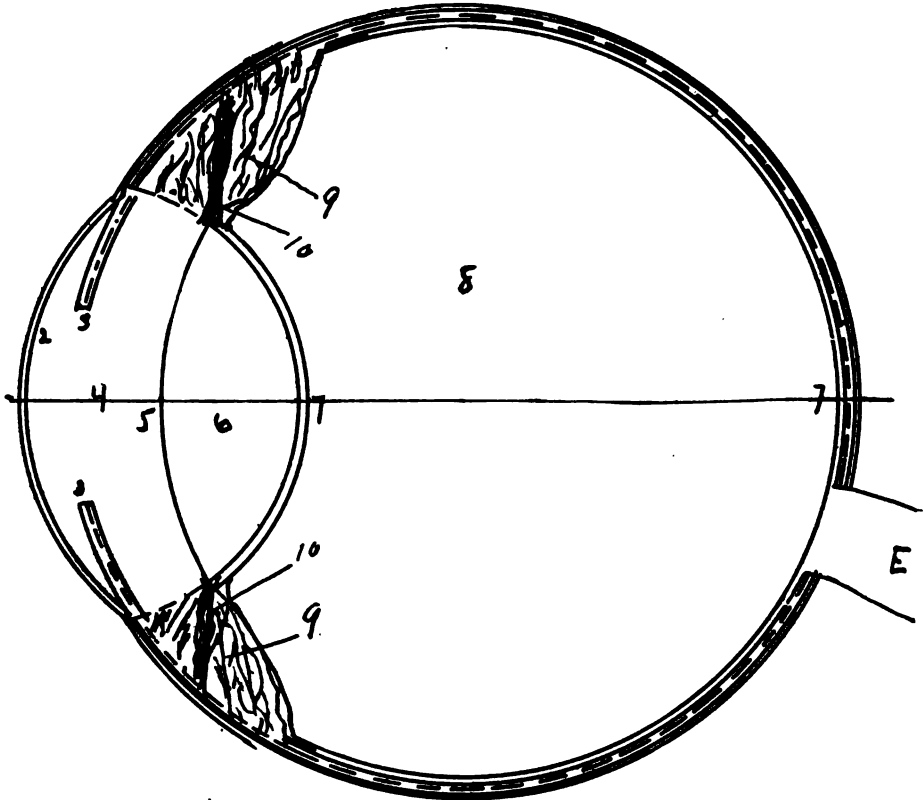


Fig. 11

age. If this sounds incredible, think what a fool I would be to make the assertion if it was not true.

The schematic eye, Fig. 11, is made to a scale, each five millimeters representing one, so that it represents an enlargement of twenty-five times, the regularly accepted dimensions for an ideal eye being:

Radius of curvature of cornea, 7.8 millimeters.

Distance of anterior of lens from cornea, 3.6 millimeters.

Radius of anterior surface of lens, 10. millimeters.

Distance of posterior of lens from cornea, 7.2 millimeters.

Radius of posterior surface of lens, 6 millimeters.

Distance of posterior of globe from cornea 22.5 millimeters.

Radius of globe, 10.8 millimeters.

The normal eye is 9-10 in. long, 8-10 in. wide, 7-10 in. high, approximately 45. units power.

The reference figures indicate:

1. Conjunctiva: a delicate membrane composed of minute blood vessels and nerves with just enough connecting tissue to complete the structure. It covers the front of the eye, as shown, then laps back inside the

lids, forming a lining, and serves the double purpose of furnishing the soft surfaces, which, when lubricated by the tears, prevent friction from winking, and being highly sensitive, it protects the eye by giving quick warning of the presence of foreign substances. It is a great exaggerator, always declaring the smallest particle is a whole brick. There is much to tell about it which will be found in the chapter on alleged diseases of the eyes, and when you have seen how simple and easily cured they are you will laugh at the oculist's fairy stories. But don't laugh at the oculist. He knows no better because a code of ethics keeps him from finding out facts.

2. Cornea: the projecting transparent portion forming about one-sixth of the outer wall of the eye. It is of cellular structure with tough surfaces so nearly like horn that its name was given on account of the resemblance. It is transparent so light may pass into the interior, and its radius of curvature is shorter than the main globe in order to give the whole eye more focusing power, for, remember, in all optical literature curvature means power, and the sharper the curve the greater the power, consequently the quicker will rays of light focus after passing it

3. Iris: the projections from the margin of the cornea; the space between the two figures represents the pupil, which appears to the observer as a black spot in all eyes. Some, even doctors, call it the "sight" of the eye. It is the hole in the iris, or curtain, through which light must pass to get back to the posterior wall, where the "sight" spot is. This curtain is formed by combining a great number of straight ligaments with a circular muscle, and the whole thing would be like a lace curtain were it not for the pigment filling, represented by the dashes. This pigment gives it color; the more pigment the darker the color. Close observation shows a variety of colors in the same curtain, hence the name iris, which means rainbow. If the nervous connections are normal it is under command of the retina, or optic nerve, and regulates the amount of light admitted. The ligaments run from the edge of the pupil outward, while the circular muscle, sphincter, it is called, being the only one supplied with nerves, reduces the pupil by contracting, thus pulling the inner ends of the ligaments together; or, enlarges it by relaxing its efforts. Some very ridiculous stories have been told about this curtain which will also be exposed.

4. Aqueous humor: fills all the space between 2 and 5 and the iris floats in it. It is briny, cool and is rarely the seat of trouble—a good hint from Nature about salt.

5. Anterior capsule of crystalline lens: the posterior one is not numbered because the one figure is enough for both. They enclose:

6. Crystalline humor, which, while a liquid, is constructed in layers, nearly like an onion. In the chapter on physics the reason for this will be explained. The lens includes the capsules and humor and is held in position

by a combination similar to that described for the iris, only larger and more powerful, for, instead of a hole, as the iris has, the lens is there to be operated, its power being increased by pressure around its edge which forces shorter radii of curvature. This function was intended for adapting normal eyes to near points. Rays from as far as twenty feet or more distant are so nearly parallel that the normal eye focuses them with very slight effort, but when they come from points nearer they are decidedly divergent, which forces the eye to increase its focal power if it would see distinctly. There is a little canal around the edge of the lens, which I call a bicycle tire, for simplicity of illustration, a hollow tube filled with liquid which makes it very elastic, especially in young and middle aged people; this tire is attached to or rather formed by the suspensory ligaments, and pulls against them almost enough to overcome them, but not quite, so that the lens remains at its lowest power except when the sphincter muscle comes to the aid of the tire and accomplishes what is called accommodation for near points. When the necessity ceases the sphincter lets go and the suspensory ligaments pull the lens back to its original static or natural condition. As we grow older the tire's contents shrink so that it is no longer so elastic and the sphincter muscle, not being able to do all the work, fails to focus light from near points at the retina and glasses have to be used for reading on eyes which are otherwise perfect. As this is an incident of old age, it is called presbyopia. When you see people who, after using reading glasses for a while, also put some on for improvement of distant vision, you will know they never had perfect eyes although they may have had perfect vision. The story of eyes "flattening" from old age is another doctor story that isn't true, as I will prove later.

7. Hyaloid membrane: a layer with a past. It originally entered the eye at "E" as a canal and passed straight to the center of the posterior capsule of the lens, carrying the material from which the lens was constructed; when that job was finished it expanded and enclosed the vitreous humor, (8), which fills the globe. That this humor is nourished by way of the same old channel there can be no doubt, because when patients come complaining of floating specks we change their diet, as is detailed in another chapter, when the specks disappear. Those specks have an interesting story, too.

The layer next outside of the hyaloid membrane is the retina, comprising a network of nerves and blood vessels, the nerves being branches of the optic, or second cranial. Its function is to transmit impressions to the brain, and its structure is complex microscopically, which, however, is not a necessary detail of this part of my story. One of its layers, that of rods and cones, has to do with the next general layer, represented by the dash lines, which is of honeycomb-like structure, the cells being filled with

pigment. This layer is for the purpose of receiving and absorbing excessive light, thus preventing injury to the retina which would interfere with vision. This layer also extends into the iris, giving it its color.

The next layer is the choroid: it carries the blood vessels and nerves which nourish and furnish motive power to the sphincter muscles of the ciliary body and iris. The ciliary body is composed of folds of the choroid and is marked "9" in the illustration. This affords a hold for the suspensory ligaments, marked "10," which support the lens in its position. This drawing shows the lower half of a right eye, as if it was bisected horizontally. The suspensory ligaments marked "10," radiate from the edge of the lens and are rooted firmly in the ciliary body.

The outside layer, extending from the cornea to "E" is the sclerotic, (hard), a layer of protection, its structure being fibrous and tough; in it are inserted the six muscles which control the motion of the eyeball. All of these muscles have their origin within the orbits, the cavities in the skull in which the eyes are set; four of them pass straight up over, under and on either side branching out until they cover the whole eyeball almost to the edge of the cornea, their function is to move the eyeballs; the other

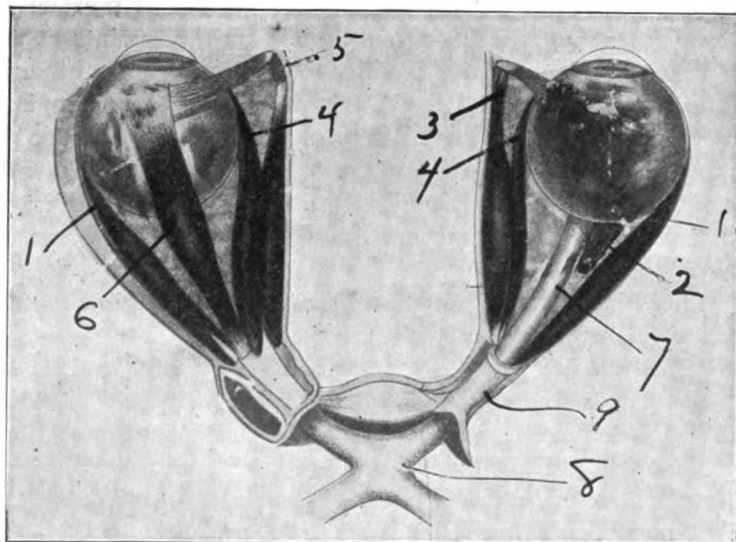


Fig. 12

two pass forward on the side next the nose, then turn and pass over and under the globes and a little obliquely backward. Their function is to prevent the eye from rolling on its axis, which is represented by the line drawn through the center. This line is called the optical axis; the old school books teach there is also a visual axis, which crosses this one obliquely, but that story is like many others by the same writers, decidedly oblique, as I will show.

"E" is the gateway through which the retinal vessels and nerves enter and emerge. In all eyes the space shown is not sensible to light impressions because the retina only begins at its edge, hence it is called the "blind spot." Outside of the space marked "E" is a zone in which the vessels which supply the choroid pierce the sclerotic coat, which has no vessels or nerves of its own. The spot marked "E" is on the inner half of the eye, but is half way between the top and bottom. The field around the posterior pole extending from the blind spot to an equal distance beyond the axis is more highly sensitive than other parts, because images of all objects seen clearly are formed there; this field has been considered important enough to be named, so it was called "macula," meaning "spot," and a German who wanted to get ahead of his colleagues imagined he could distinguish a decidedly yellow color in it, and he added the word "lutea," meaning "yellow." His victims adopted his statement and have ever since reiterated the falsehood, thus affording opportunity for practical students to see how little such writers are worth as authorities.

Fig. 12 shows the relation between the two eyes and the arrangement of the muscles which arise from a cartilaginous substance in the orbits just behind the eyes.

- 1-1. External recti, operated by 6th nerves, turn eyes outward.
2. Inferior rectus, operated by 3rd nerves, turns eye down.
3. Inferior oblique, operated by 3rd nerves, prevent eyes rolling inward at the top and outward at bottom, around axes.
- 4-4. Internal recti, operated by 3rd nerves, turn eyes in, associated automatically with accommodation.
5. Superior oblique, operated by 4th nerves, prevent eyes rolling inward at bottom and outward at top, around axes.
6. Superior rectus, operated by 3rd nerves, turns eye up.
7. The optic or 2d nerve, to the retina.
8. Optic nerve commissure, or switch-yard where the nerves cross over and divide; the right nerve supplies the left half of each eye, and the left nerve the right half of each eye; thus the macula of the right eye is supplied by the left nerve and that of the left eye by the right nerve.
9. Optic nerve sheath, for protection.

The lids or palpebrae, comprise superior and inferior tarsal cartilages. areolar or connective tissue, the skin and the conjunctiva.

The muscles of the lids are:

Corrugator supercillii; 3d nerves; draw brows down and in.

Levator palpebrae superioris; 3rd nerves; lift upper lids.

Orbicularis palpebrarum; 7th nerves; close lids.

Tensor tarsi; 7th nerves; press the edges of lids to globe, retaining and distributing lachrymal lubrication.

The meibomian glands traverse the tarsal cartilages and connect with

ducts to the free margin of the lids. They are most plentiful in the upper lids and their function is to carry off accumulations from the lachrymal fluid which penetrate the conjunctiva. See chapter on alleged diseases of the eyes.

The lachrymal glands are situated at the upper outer angles of the orbits and supply fluid for lubrication. It passes away through the lachrymal canals, at the inner angles of the eyes into the nasal duct. See chapter on alleged eye diseases.

The blood supply of the eyes and lids comes from the ophthalmic arteries, which are branches of the internal carotids, branches of innominate and left common carotid, branches of the aorta, from the heart. It leaves the eyes through the ophthalmic veins to canals, in the base of the skull, which connect with the internal jugular, thence to the subclavian, innominate, superior vena cava and heart.

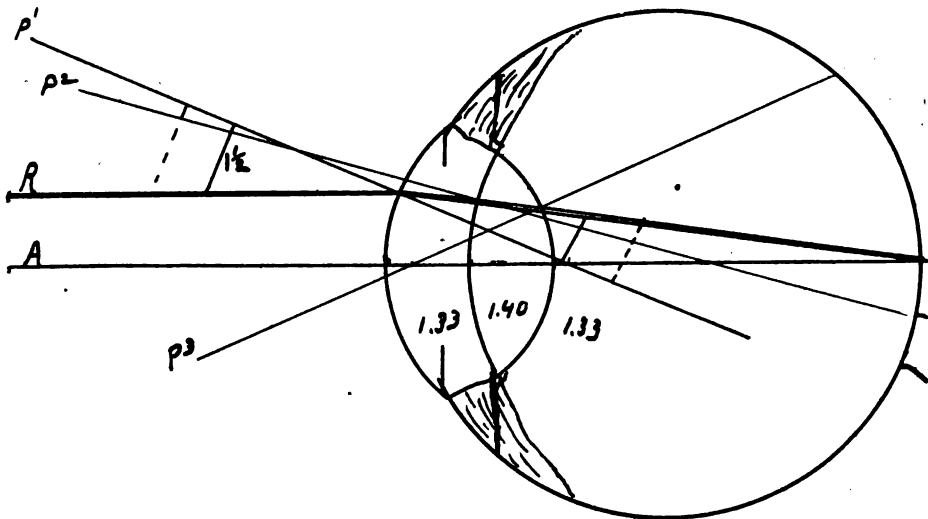


Fig. 13

Fig. 13 shows how refraction occurs at the cornea and at both surfaces of the lens. A is the principal axis, R is the ray approaching from infinity parallel with the axis, P¹ is the perpendicular to the cornea, P² the perpendicular to the anterior surface of the lens, P³ the perpendicular to the posterior surface of the lens. Assuming that the entire eye is of one density and that equal to glass, index 1.50, the angle marked 1 1-2 outside and the one marked 1 on the inside would indicate the course to be on the lower line to the retina; as a matter of fact the ray follows the upper line, requiring three calculations to carry it through cornea and lens, but I have made both lines to show that as a time and work saver the coincidence is a happy one, because either gives the same result practically. To make the real course the angle outside of the cornea is to the one inside as 4

is to 3 because the index of the cornea and aqueous is 1.33 while the air is 1.00; then the angle outside the lens, in the aqueous, is to that in the lens as 21 is to 20 because 1.40, the index of the lens, is to 1.33, the index of the aqueous, as those figures are to each other. It is found in this way: $1.33 = 4/3 : 1.40 = 7/5$; reduced to a common denominator the former is $20/15$ and the latter $21/15$. The larger angle being in the rarer medium the figures reverse, of course. Then in passing the posterior surface of the lens the angles are as 20 is to 21, the larger angle being in the vitreous

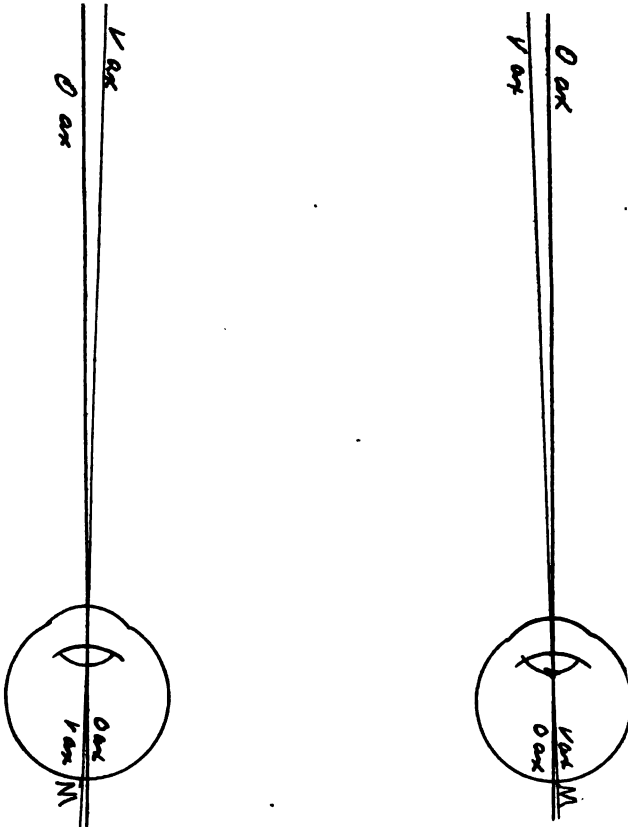


Fig. 14

humor. Make the drawing on a scale of 1 inch for the millimeter, according to the figures given on another page and the magnification will make the points clear.

This is called the static refraction of the eye because the muscles controlling the lens are at rest. As this eye focuses at the retina it must be emmetropic.

The alleged "old masters," who have written great works on the eyes, had a lot of idols they worshiped, because, with them they were able to mystify their readers into accepting them as authorities because they were

incomprehensible. Fig. 14 shows one of these idols, naked. The lines O ax are the optical axes because they pass from pole to pole through all the nodal points; the lines V ax show what they called the visual axes. They insisted these were necessary because when the eyes are completely at rest the optical axes must be parallel, hence we would see double were it not for these visual axes which they described as secondary axes, necessarily. Of course their claim was purely theoretical, and, had they given the matter a second thought they would not have made it because no eye, emmetropic or hyperopic, can be at rest absolutely when looking at a distance for the reason that while, for the purpose of illustration, we assume the rays approach the eyes parallel when they come from infinity they are really a trifle divergent and for the same reason that a pair of perfect eyes in looking at a point 40 inches distant, accommodate 1.00 D. each and converge .50 each, they must accommodate for an 80-inch point .50 each and converge .25 each and for one mile each would have to accommodate $1/1600$ of a diopter and converge $1/3200$. In maintaining the ratio of .50 convergence to 1.00 accommodation for all points, near or far, it is clear that no separate "visual" axes are necessary, and if there were such things they would cause incoordination. Therefore that story is on a par with the other one they tell about the displaced macula, as if it slipped around like a disjointed bone.

While we are breaking idols, let us smash another. Fig. 15 shows the line X V F as the visual axis; the line A O the optical axis; the line X C the "line of fixation;" N N the nodal points; the line N E the "major axis of the corneal ellipsoid," and C the center of rotation. They tell us the angle formed by the line of fixation and the optical axis X C A, is the "angle gamma," and that formed by the "visual axis" and the "major axis," X N E, is the angle alpha. That was certainly Greek enough for the most exacting, (Landolt apologizes for it, explaining that his drawing is "very schematic"), but unfortunately it is a false proposition for the reason given with reference to Fig. 14 where it is shown that there is no visual axis separate from the optic axis, because none is needed, hence the smashing of the one idol kills the other.

The relation of accommodation to convergence causes trouble when there are errors in the dioptric systems of the eyes because the hyperopic eyes need the accommodation but not the convergence for distant objects, and they need more accommodation for near points than goes normally with the convergence necessary, while the myopic eyes cannot see at a distance because their far points are nearer than infinity, and when the object is brought near enough to see they need the convergence without the accommodation that normally goes with it, therefore, in both instances there is in-coordination. In the hyperope the ability to compensate or adapt the organs to the situation is supplied by way of the 6th nerves to

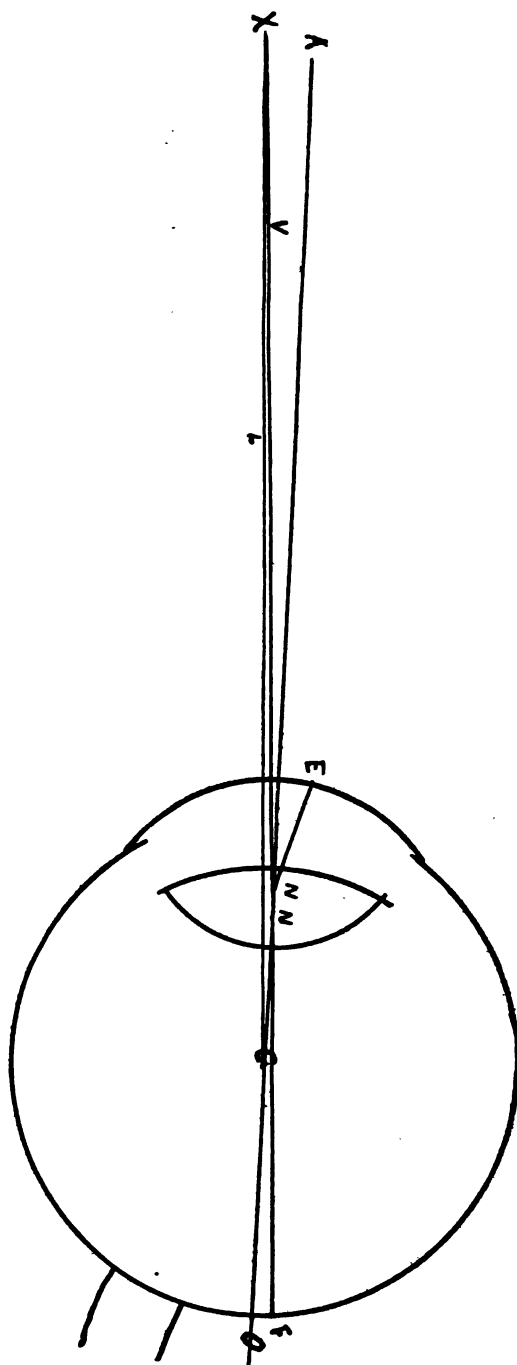


Fig. 15

the external recti which antagonize the interni to the extent of maintaining parallelism of the axes, so that binocular vision is afforded, but the strain on the nerve supply is enormous. Each diopter (unit) of accommodation being accompanied by .50 convergence, requires at least .50 negative pull via the 6th nerves, making the total demand on the nerve supply 2. D. Thus a hyperope of 1.00 D, each eye has 4. D. strain. Taking one second as the unit of time measure, 4. D. per second means 240. D. per minute, 14,400. D. per hour and 230,400. D. per day of sixteen hours. In order to realize fully what this means we must find out what the average demand is in the case of an ideal person, with normal eyes. An emmetrope, working at 13 inches three hours daily, which is a fair average, would use 3. D. each eye for accommodation and 1.50 D. each for convergence, a total of 9. D. per second, 540. per minute, 32,400. D. per hour, 97,200. D. per day's work. At all other times the eyes are practically at rest. The eyes receive their supply from four and one-third pairs of nerves, and the work figured above only accounts for the branches of the 3d pair which operate the ciliary sphincters and the internal recti. As the other branches of the 3d, 2d, 4th, 6th and the ophthalmic branches of the 5th have comparatively nothing to do, and as we are unable to measure what they do, we think it reasonable to grant them enough to make the above figure 100,000, hence we charge 2,800. D. for them. Now, as these four and one-third pairs are 36 per cent. of the entire number of cranial nerves and 10 per cent. of the entire number in the body, and as any other four and one-third pairs will show one or two doing the chief work, we conclude it is not unreasonable to estimate the proportion throughout, and multiplying 100,000. D. by 10 gives a grand total of 1,000,000 D. daily as the average needs of the entire system, hence we assume that to be the average capacity. Of course overdrafts may be made occasionally without danger, but the constant drain caused by 1. D. hyperopia shows a daily excess demand of over 23 per cent. and for the purpose of easy calculation we call it 24 per cent. Thus 1.50 D. hyperopia would mean 36 per cent. excess; 2. D., 48 per cent.; 3. D., 72 per cent.; 4. D., 96 per cent. Above that there is comparatively little strain, because the demand is so great there is little effort, except for brief periods. But we do find, as a rule, such cases are dull mentally, although quite hearty physically. When we know that hyperopic eyes are the only organs in the body that can overcome their own defects, it is plain that the strain must be a factor in all the functional derangements such people suffer from. If they are astigmatic it is all the worse, because there is a constant effort to overcome that fault by accommodation and it cannot be done because that effort affects all meridians alike, the astigmatic error being in the cornea and the accommodation in the lens. No point being made on the retina by the effort, it is much like trying to climb a greased pole—lots of work but

little result. This is why astigmatism causes more headaches than simple hyperopia does. If the astigmatic error is as much as 2. D. or more, it causes less trouble than the smaller amounts because vision is so bad there is little attempt to improve it.

Our critics, referring to the nerve strain calculation, say: "According to your own figures only 9.72 per cent. is actual measure and the rest is estimate." Yes, but taking the eyes alone, 97.2 per cent. is actual measure and all of the hyperopic strain is actual measure, while the estimated part is applied equally to both, so that by the law of ratios the conclusion is exact and must yield the same results no matter by what system the calculation is made. The neurometer was based on this calculation and it works. Our clinical analyses are based on these figures and they work.

The hyperope, because of the constant activity of his accommodation develops remarkable strength in that department, even while sacrificing other functions, and he naturally notices the disturbance elsewhere before he does in his eyes, because the extra current of energy only makes the eyes perform their functions normally while other sphincter systems throughout the body, which are normal, receive the extra current too, and it makes them overdo their work, with the result that there will be interference with the circulation of blood, there will be constipation, bladder troubles, the heart, stomach, lungs and muscular action generally will be insufficient or hypersufficient, and women will suffer from menstrual derangements. But these are not all. The supply of energy in the cerebellum being depleted, there will be a deficiency in the acid reactions in the stomach and elsewhere, the blood-making and cleansing organs will fail for chemical, as well as mechanical reasons, and then the whole body is subject to any or all the disorders flesh is supposed to be heir to. The abnormal strength of accommodation is also a source of anxiety on the part of the doctor who attempts to analyze the case, part of which analysis is measuring the amount of the hyperopia, hence the necessity for a method of procedure which will enable him to overcome or circumvent spasms, tonic or clonic.

The need of such method is not limited to the hyperope, for the myope often has spasms from the incoordination of accommodation and convergence at near points, although his nerve strain is not great enough to set up other functional disturbances. A myope of 2. D. will rarely read farther away than six or eight inches, although, theoretically, he should read at twenty inches. The reason is that when he holds a paper at thirteen inches the convergence is necessarily 1.50 D. in each eye; this brings with it automatically 3. D. accommodation, which, added to his myopia makes his dioptric system 5. D., requiring the object to be at eight inches. When it puts it there the eyes must converge 5. D., or 2.50 each and this brings 5. D. accommodation in each eye, which, added to his

myopia makes 7. D. and puts the first conjugate focus at five and one-half inches. By this time his accommodation, which is not so vigorous as the hyperope's, becomes exhausted and there is a harmony of accommodation and convergent points. But all this tends to make the accommodation active enough to fool any one who does not understand the physics and physiology of the proposition. Old time opticians fitted such people by having them hold a newspaper as far from the face as they could and read a line, then measuring the distance in inches and giving the number corresponding. They wondered why the purchaser returned complaining, but weakened the lenses time after time until they found comfortable ones. If their patrons developed stomach trouble and headaches later they never thought the eyes had anything to do with it, nor did the wearers, who went to the doctors for medicine. Later in life they found they could see better with weaker glasses and could see at a greater distance with their naked eyes, hence the idea that the eyes flatten with age. This was corroborated, apparently, by the fact that hyperopes, who never wore glasses for distance until long after they had used them for reading, finally found they could use convex glasses to advantage for distance. This was because their accommodation could no longer overcome their defect. Even to-day some oculists will insist the eyes do flatten with age. There are also people who declare the earth is flat. The myope described above would have been given — 6. to begin with and gradually reduced to — 2.50 or 3. when he would have still been hyperopic .50 to 1. and suffering nerve strain, where before he only lacked vision. An interesting test for such cases is to have a real myope, or a hyperope made myopic by over-correction with + 5. or 6. D. spheres, hold a paper as far from his face as he can read, then interpose a pair of 5 or 6-degree prisms, bases in, and note how much farther he can extend the paper, thus proving that accommodation is automatic with convergence, because when the prisms stop the necessity for convergence the accommodation lets go too.

One of the infirmities of age is a loss of accommodative power, because the lens is held in suspension and at its static condition by a lot of straight ligaments which are almost overcome, in early life, by the antagonism of the bicycle-tire arrangement surrounding the lens, so that comparatively little nerve force is required, but as this tire loses its elasticity, from shrinkage of contents, it leaves more work for the nerves than they can do, hence the need of glasses for near work, even for emmetropic eyes. This is presbyopia. It is called total when the person accepts a lens equal to the full measure of the distance he works; thus if + 2.50 is accepted for work at sixteen inches he would be totally presbyopic, because he would never need any stronger glasses for that distance. This would be called total presbyopia even if he could read at eleven inches with the same lenses thus exhibiting 1. D. accommodation. An emmetrope sixty years old would do that, and a hyperope of 1. D. seventy years old would do it.

LIGHT AND REFRACTION

Elementary Laws Which Reveal the Breadth and Comprehensiveness of Nature.

Everything, to our minds, educated by finite things, must have a beginning—and an end. Therefore, let us imagine that there was a beginning to this universe; that it is the effect of a cause. It is a well-settled proposition, except among fanatics, that we shall never conceive in what form, if any, that cause existed or exists, other than as we refer to it as an infinite mind, instead of as a person. To me the law, as exhibited in its effects, is far more magnificent than an individual could be possibly.

It is our privilege to study the laws, if we will, independently of accepted authorities; and when we see how far some have strayed from facts, which came to light after their theories were exploited, we are admonished to avail ourselves of the privilege.

As the refraction of light is one of the primary laws by which neurology is expounded in this work, it is necessary to define light and I choose the following hypothesis as a beginning:

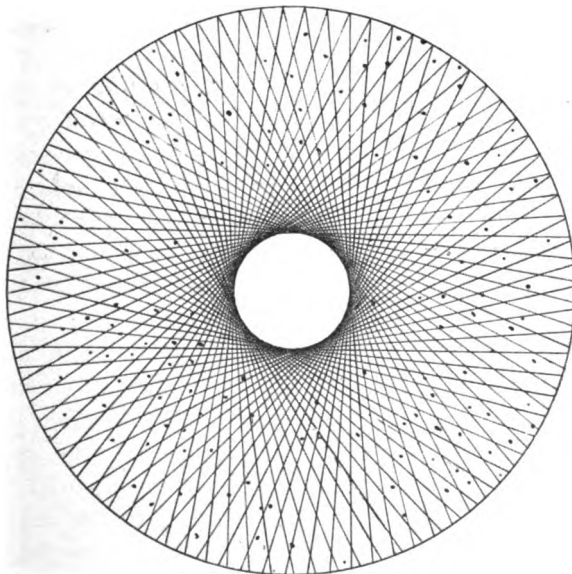


Fig. 16

Let Fig. 16 represent the universe, the large central field the sun, the small dots the planets. In the operation of the chemical laws com-

bination and disintegration, attraction and repulsion, form and motion were produced. Within a certain space the positive and negative qualities of each planet are supreme, so they maintain their respective distances from each other, yet there is one grand center about which they all revolve. The chemical products, or the friction from motion, or both, generates what is known as electricity. First the centripetal effect is to overcharge the center, when a centrifugal reaction obtains and we have the duality complete in positive and negative magnetic currents. The lines in the figure show only the negative ones, that is, those from the sun, and only a few of them. The sun being as large in comparison with the planets as the center field is larger than the dots it is easy to see how these currents reach all the planets, all the time, except when occasionally one planet gets in the way of another enough to shut off the currents from a small portion for a short time, as is illustrated by eclipses. This electricity reaches us in the form of a luminous force and not only enables us to see objects not luminous themselves, but it also vitalizes the earth, making it habitable and productive.

Some writers have asserted that there is no such a thing in nature as a convergent ray. I concede the point and assert further that there is no such thing as a divergent ray. It requires two or more rays to exhibit convergence or divergence, and when we have a multitude, as we have from the sun, there are both convergence and divergence, as is shown in the figure. Of course when we look at a small object some distance away the rays we receive in the pupil of the eye are divergent from each other as they radiate from the same points; but as the pupil is only about one-eighth of an inch in diameter the rays enter it so nearly parallel that they are assumed to be exactly so in our calculations.

Refraction is the deviation in its course a ray of light suffers in passing obliquely from one transparent medium to another of different density.

The amount of refraction is governed by a duality, the angle of incidence and density of medium; it is measured according to natural laws.

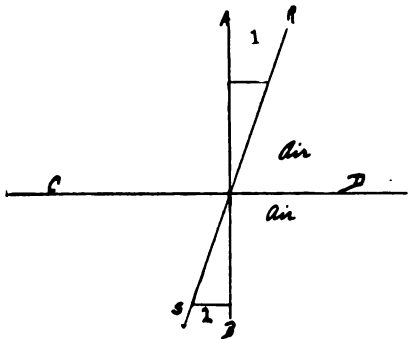


Fig. 17

Let the line R S, Fig. 17, represent a ray of light passing obliquely

through air; it suffers no change in its course at the line C D, because there is no change in the density; therefore, the angles 1 and 2 formed by the ray with the line A B, are of equal size. Air being the medium through which all light comes before it can pass any other, and being the rarest of all, it is taken as the standard or unit of density, that is, of resistance to the passage of light, and all other mediums are compared with it, the ratio they bear to it respectively is called their index of refraction.

The first thing required for the purpose of measurement of the amount of refraction is a line drawn perpendicular (at right angles) to the surface under consideration. If the surface is horizontal, the perpendicular will be vertical; if the surface is oblique the perpendicular will also be oblique. An easy way to locate the perpendicular is to make the point where the ray strikes the second medium the center of a circle and put the perpendicular 90 degrees from the surface. Thus, if the surface is at an angle of 45 degrees the perpendicular will be at 135 degrees. Or if the surface is at 120 degrees the perpendicular will be at 30 degrees. All degrees are numbered from the horizontal and begin at the right. All measurements are at right angles to the perpendiculars and as the denser the medium the slower the speed and the rarer the medium the greater the speed at which the ray travels it follows that in measuring angles we must reverse the figures, therefore, if we bear in mind that we have only two sizes of angles and the small one is always in the denser of the two mediums it will be easy to master the very necessary preliminary work quickly.

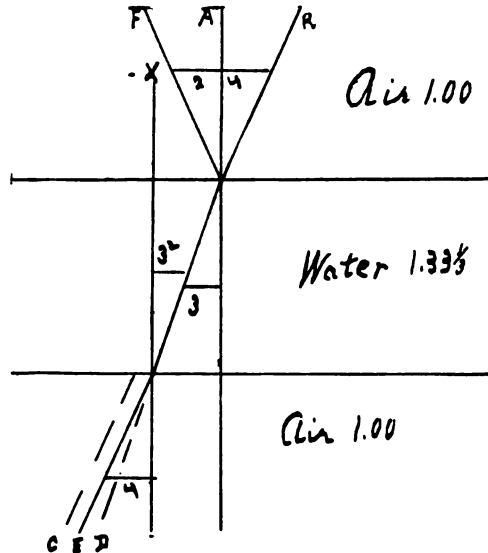


Fig. 18

Fig. 18 shows what would occur if a ray from R should come in contact with a body of water at the point where it crosses the line A. Its

course would be changed, for the reason that its movement is swifter in the rare medium, and, its lower side, meeting the obstruction first, would be retarded in its progress, while the upper side would continue its speed, thus gaining on the other, so that the course of the ray through the denser medium would be toward D instead of in the direction C. As it passes obliquely through the water, it will be seen the lower side would be released first, and, renewing its original pace, would gain on the other side, recovering what it had lost at the first surface, and would pass toward E, parallel to, but not on the line of its original course..

From the amount of deviation as shown by the proportions of the angles formed in the two mediums, we learn the relative density, for 4 is to 3 as 1.33 1-3 is to 1.00, therefore the index of refraction of water is 1.33 1-3. If we substitute glass for water we would have angles proportioned as 3 is to 2, hence the index of glass is 1.50. If we could substitute diamond the angles would be as 5 is to 2, hence the index of diamond is 2.50.

According to its index of refraction water would cause the ray to change its course so that the angle formed by the ray and the vertical line at 3 would be in proportion to that formed by the ray and vertical line at the same distance 4 above the first surface, as 1 is to 1.33 1-3.

The same law applies in passing from the dense to the rare medium, below, the angle at 4 below being 1.33 1-3 times as great as that at 3².

A ray is called incident before it enters the denser medium, refracted during its passage and emergent after it has passed.

The angle formed by the incident ray and the vertical line A, is called the angle of incidence; that formed by the refracted ray and the same line, the angle of refraction; and that formed by the emergent ray and the line x, the angle of emergence.

A ray, in making a passage as illustrated, suffers the loss of a portion by reflection at the first surface, and it is a law of optics that the angle of reflection always equals the angle of incidence, hence it follows that the reflected portion would pass toward F forming another angle with the line A, called the angle of reflection.

It will be observed that the angles of emergence and incidence are of equal size; therefore, a ray starting at E, would pursue the same course, and R would be the emergent ray, which fact gives us another law, viz.: The course of returning rays is always upon the same lines on which they enter.

If an incident ray forms an angle with the perpendicular greater than about fifty degrees it will suffer total reflection. This is called the limit angle.

Fig. 19 illustrates the first essentials of refraction. Understand, the word means "to break." Rays passing obliquely from one transparent medium to another of different density suffer refraction. But they must

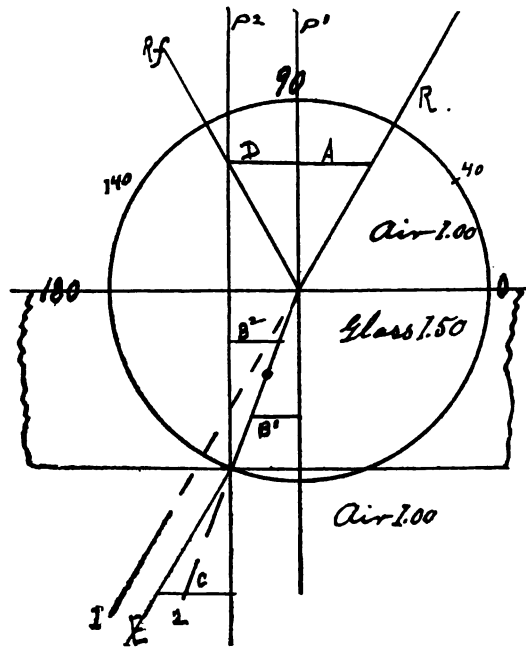


Fig. 19

not approach at too great an angle or they will suffer total reflection. Rays on the lines "P1" and "P2" would pass straight through the glass because they strike its surfaces perpendicularly. As the density of the air is only 1.00 while glass is 1.50 (it is really about 1.53, but we use the 1.50 because it is easier to make the calculations clear to the student and the principle is shown as well), it follows that the ray will pass through the air faster than through the glass, hence to get the comparative rate of speed in the two mediums we reverse the figures, giving air the 1.50 and glass the 1.00. Then one inquires what becomes of the quantity of light indicated by the figures as approaching the glass, greater than its evident capacity to receive. It is reflected as perpendicularly as the ray strikes. But when a ray strikes obliquely, as the line R, the reflected portion takes a direction as oblique as the ray approached and on the other side of the perpendicular. The amount lost by reflection increases as the angle of approach increases until the limit angle is reached, which is about fifty degrees from the perpendicular, at the points marked 40 and 140, when total reflection occurs. The ray R, called the incident ray, forms an angle, A, with the perpendicular and it is called the angle of incidence. Imagine there is nothing shown but the two mediums, the line R, the perpendicular and the line A. As the index figure of glass is three halves while that of air is only two, and as the speed of the ray in the air is the greater, we know the angle must be also, hence we take the measure where it is easiest, that is, where it measures three points; (a point may be a

millimeter, an eighth of an inch, or any other unit one chooses for a calculation); then go the same distance below the surface of the glass, B_1 and measure two points, because that represents the relative speed in the glass and the relative size of the angle therein; then draw the line R from surface to surface of the glass past the end of the line B_1 , this is the refracted ray and the angle B^1 , is the angle of refraction. Now imagine the line P^2 has just been drawn perpendicular to the lower surface of the glass where the ray strikes; we know the small angle is in the glass so we measure B^2 , two points, then go as far on the other side of the surface and measure three points at C, then continue the ray from where we left it at the lower surface, toward E. This is the emergent ray and the angle formed by it with the perpendicular is the angle of emergence. Note that a ray, whether refracted or reflected, always crosses the perpendicular; that the angle A is to B^1 as 3 is to 2, and the angle B^2 is to C as 2 is to 3. The great angle is always in the rarest medium, therefore if we know the index figures of the two mediums we can find where a ray will go. The angle of reflection is always equal in size to the angle of incidence. The ray R starts toward 1, is broken at the first surface and takes direction of 2, is broken at second surface and takes final course to E. The reason a ray suffers refraction is that as it approaches obliquely the lower side of it strikes the slow speed first and as it leaves the denser medium the lower side resumes the rapid speed first. This is why in entering a denser medium the ray is broken toward the perpendicular and in leaving is broken from the perpendicular. The dot in the middle of the refracted section is to show that if it were the luminous point from which rays started the one directed upward and that directed downward would strike the respective surfaces at the same angles, hence the angle of incidence, A, and the angle of emergence, C, are of equal size. But this is not always true, except in plane surfaces.

The points of particular interest in connection with this illustration are:

First. An oblique ray, passing from one transparent medium to another of different density suffers a change in its path, but not in its general direction.

Second. The denser the medium the slower the rate of speed of the ray.

Third. The reflected portion passes away at the same angle the ray approached.

Fourth. The small angle is always in the denser medium.

Fifth. There is a duality of mediums, a duality of connecting surfaces, a duality of perpendiculars and a duality of indices.

Sixth. There is a positive refraction as the ray enters the denser

medium and a negative refraction as it leaves; that is, the ray is broken toward the perpendicular on entering and from it on leaving.

Seventh. There is a double duality of sections of the ray, incident, reflected, refracted and emergent, and corresponding angles formed by the sections and the perpendiculars.

Eighth. A ray suffers reflection, refraction, dispersion and absorption.

Ninth. The density of the glass compared with air is as 1.50 is to 1.00, therefore, the angles in the air are always one-half larger than in the glass, and, being given one we can always find the other.

Tenth. The comparative angles are always on opposite sides of the perpendicular, as they are on opposite sides of the connecting surfaces of the mediums.

Eleventh. The amount lost by reflection gradually increases until the limit-angle is reached, when the ray is totally reflected.

Twelfth. The limit-angle, where total reflection occurs, symbolizes one's limit of endurance, of patience, of capacity, etc., metaphysically and physically.

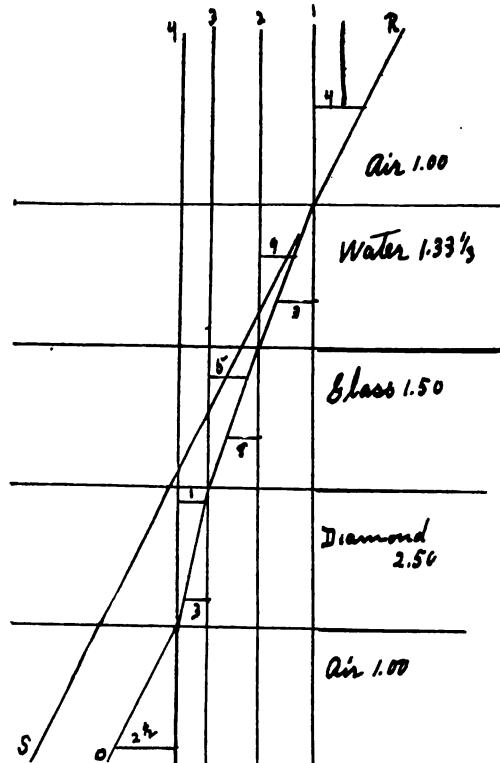


Fig. 20

In order to make indices clearer, Fig. 20 is given at the risk of confusing the student. Here the ray, R, starts toward S but is refracted by

several mediums and finally passes away on the line O. The indices given are all in comparison with air, so that in the refraction which occurs as the ray passes from water to glass and from glass to diamond, we must find the relation they bear to each other, which is easy because all we have to do is to find the ratio the figures given bear to each other; thus $1.33 \ 1-3=4-3$ and $1.50=3-2$; then multiplying the denominators to get the common denominator, we get 6; as $4-3=8-6$ and $3-2=9-6$, the relation between water and glass is as 8 to 9, and if 8 is 100 per cent, 9 is 1.12 1-2 per cent, hence the last figure is the index of glass when compared with water. The figures for glass being $1.50=3-2$ and for diamond $2.50=5-2$, there is already a common denominator, and they bear the relation of 3 to 5; if 3 is 100 per cent, 5 is 1.66 2-3 per cent, and is the index of diamond compared with glass. The lengths of lines in the cut bear out the respective indices in their proportion to each other. The line 4 is to 3 as 1.33 1-3 is to 1.00; the line 9 is to 8 as 1.50 is to 1.33 1-3; the line 5 is to 3 as 2.50 is to 1.50; the line 1 is to 2 1-2 as 1.00 is to 2.50. The vertical lines 1, 2, 3, 4 are the perpendiculars to the surfaces where refractions occur.

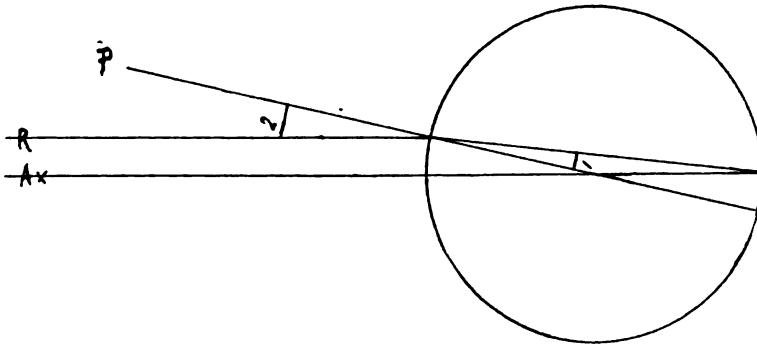


Fig. 21

Fig. 21 shows how to find the index of a medium if both the incident and refracted sections and the index of the rare medium are given. Knowing that the index of air is 1.00 all that need be done is to erect the perpendicular, P, measure the angle at 1 and go as far outside the globe, along the line P, as the first angle is inside, measure the angle at 2, which, being 2.22 times as great as 1, proves the index of such a medium would be 2.22.

A globe of glass, with 1.50 index focuses beyond itself, as is shown in Fig. 22.

If the globe were a diamond the focus would be as shown by the dotted lines, Fig. 22, the angle of incidence 2 1-2 and angle of refraction 1. I do not like to make one drawing tell too many things, but it is not desired to give too much prominence to practically useless features, which, nevertheless, are valuable theoretically.

Fig. 23 shows what happens to a ray in passing a prism. In Figs. 19 and 20, the surfaces were parallel, so that had rays approached perpendicular to the first surface, they would have also been perpendicular to the second and would have passed through without refraction. By this figure it will be seen no ray can pass without refraction, for if it came to

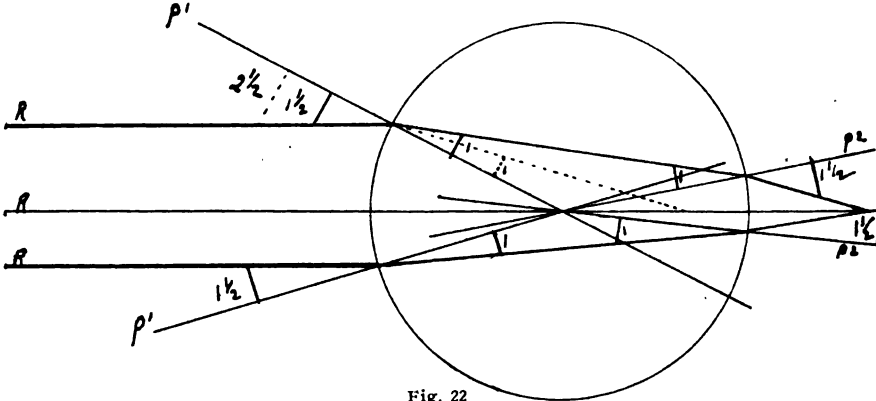


Fig. 22

the first surface at a perpendicular it would be refracted by the second surface, because it is not parallel with the first. A ray starting from A toward C would be refracted by the first surface toward α , and by the second surface toward B; and a ray starting from B toward O would first be changed to the direction X, then toward A. Thus an eye at A would see at C an object really situated at B, and an eye at B would see at O an object really located at A. Rays are always refracted toward the base of a prism and objects seen through a prism always appear nearer the apex.

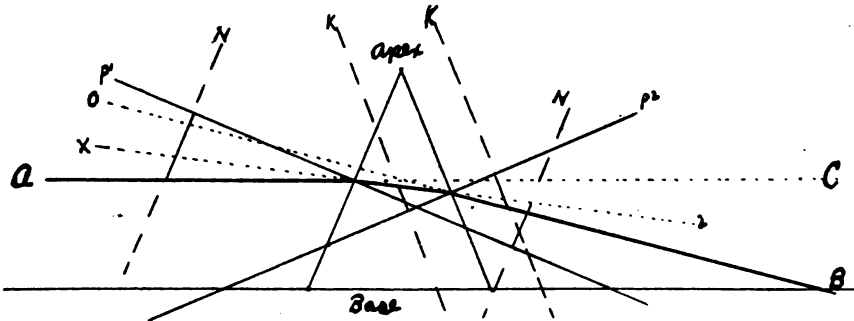


Fig. 23

As there is no transparent material having the index indicated by Fig. 21 and as glass would only focus as shown by Fig. 22, if we wanted a glass apparatus that would focus at its posterior pole we would have to make the anterior curvature from the center C, Fig. 24, instead of from the center, N, thus making up in angle of incidence what is lacking in density. The refraction of R^1 having been measured, and the surface being spherical, we know where R^2 would go without measuring.

These apparent objects are called virtual objects because we do not see the real thing. As a matter of strict fact all who wear glasses only see virtual objects, for convex lenses magnify and concave ones minify.

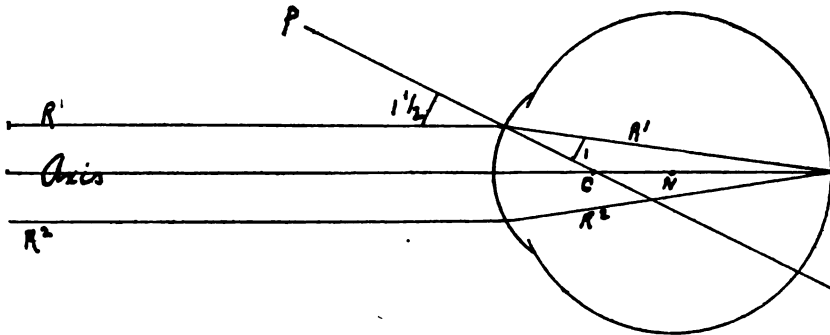


Fig. 24

This is compensated for, however, by the facts that those who need convex lenses have eyes that do not magnify as much as normal ones and those who need concave lenses have eyes that magnify more than normal, thus nature takes care of her children. In figure 22 the lines P^1 and P^2 are perpendicular to the surfaces, and the lines $N N$ and $K K$ show where the angles were measured.



Fig. 25

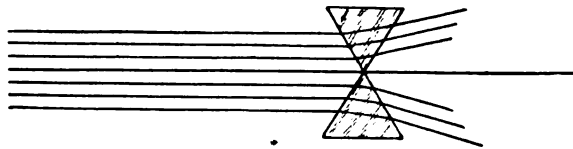


Fig. 26

Prisms in multitudinous quantities form all lenses of every description. If placed bases together as shown in Fig. 25, there will be positive effects, hence such lenses are known as $+$. If the prisms are reversed as shown in Fig. 26, the effects are negative, hence lenses having this general form are known as $-$.

Observe in both Figs. 25 and 26 the central lines pass through without refraction; this is because the two surfaces are in such relative position that they are parallel at these lines and the rays, being perpendicular, pass without refraction; hence the lines are called axes and the rays are axial rays.

Note in Fig. 25 that while parallel rays meet on the axis after passing

the prism, they do not meet at a point common to all. In order to utilize the principles of refraction for optical purposes it is necessary to grind curved surfaces so that there will be the effects of a multitude of prisms of different angles in order there may be at least approximately one focal point for all rays that come parallel with the axis or divergent from the same given points on the axis. If the rays approach parallel with the axis they meet at the nearest possible point on the axis after passing the lens; this is called the principal focus.

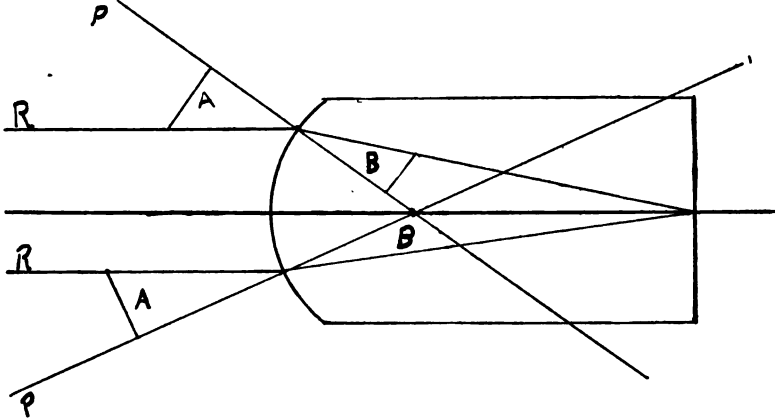


Fig. 27

In Fig. 27, R and R approach parallel to the axis but at different distances from it, but the angles A and B bear the same relation to each other in both instances and the result is that the rays focus at the same point on the axis. Observe that the lower set of angles are longer from base to apex than the upper ones, because the upper ray strikes the sharper curvature. The fact that the curvature would, if continued, form a perfect sphere, caused the name spherical to be given such lenses. They may be either convex or concave, and each class is subject to three forms of construction as shown in Fig. 28.

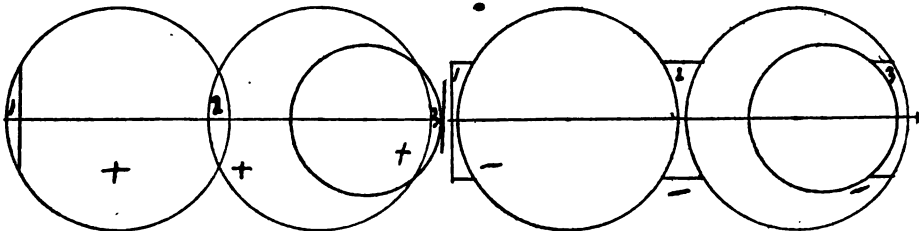


Fig. 28

Fig. 28 illustrates the positive (+) and negative (—) structure of spherical lenses, one set is cut from the globes and one set so that globes would fit in them. Particular attention is directed to understanding the little essentials, which, I have found in school work, are often neglected. Fig. 29 shows edge views of lenses corresponding to Fig. 28.

These are the popular forms, but there are many others embodying the same principles, such as the lenticulars, as they are called, for which a piece of plane glass is used to get the size, and in the center a small space

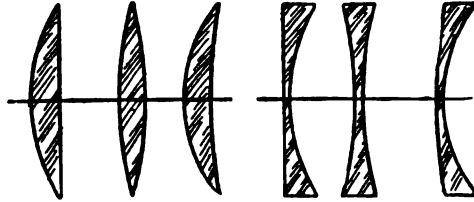


Fig. 29

is ground to desired curvatures in — and for + a small piece is cemented on. Fig. 30 shows first the front, then the edge views of such lenses. Then there are lenses ground like Fig. 30 on + lenses 1, 2, 3, Fig. 29, for the purpose of making strong lenses without the thick edges of 4, 5 and 6, Fig. 29. Then there are alleged toric lenses and real torics and sphero torics. The American standard periscopic or meniscus lenses are ground with fixed amount of concavity on one side and with enough convexity on the other to give the desired focal power. During the past few years opti-

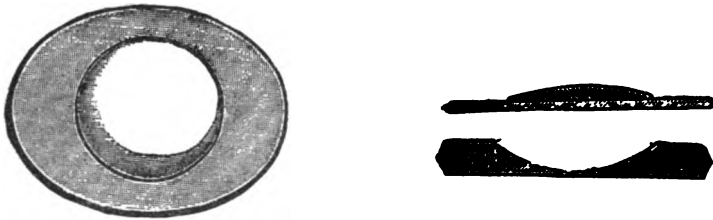


Fig. 30

cians who are not content with reasonable prices for ordinary lenses, foisted upon gullible people, including some oculists, what they call a toric lens, but which is nothing more or less than a deep concavity on one side of a meniscus. They are not only of no benefit, but are really harmful, because they intensify spherical and chromatic aberration in the stronger numbers, and oculists who endorse them advertise their culpable ignorance of optical principles and physical laws generally. Before explaining the toric lens I must give some preliminary facts:

Chemically glass belongs to the class called salts. Common glass is made by melting together silica, (sand), calcium carbonate, (limestone), and sodium carbonate, (soda). If potassium be substituted for sodium, and lead for calcium, the quality is finer; in other words the finer the material used the better the product. Flint is clearer than crown glass because there is more lead in its composition, but it is softer, which gives it a peculiar quality to be described.

It is well known that natural light is composed by a combination of all the spectral colors. The passage of a ray through any medium which

reduces its original speed causes a derangement of its components, the medium absorbs a portion, while it also makes an attempt to disperse it into its elementary colors; so, any ray, in passing from one transparent medium to another of different density, suffers from reflection, dispersion and absorption; and, if it passes obliquely, it also suffers refraction.

Were it not for reflection we could not see objects which are not luminous; and, were it not for dispersion and absorption the power of the reflected light would be so great as to be painful to the nerves of vision.

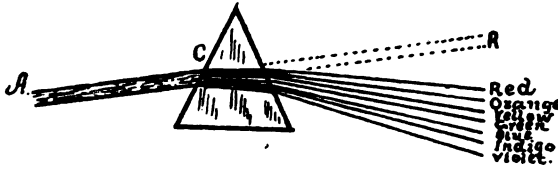


Fig. 31

Fig. 31 illustrates the dispersive power of glass, with the ray passing from A toward R, at such an angle of incidence that the greatest possible effect from the prism, C, is shown.

Flint glass, with a refractive power about equal to, has twice as much dispersive power as the crown glass from which spectacle lenses are made, so that a prism of half as great angle as the cut shows, would, if made from flint glass, exhibit as much dispersion. It was the discovery of this which enabled the makers of the finer grades of optical and mathematical instruments to attain their present approximate to perfection. Previously two factors interfered with the successful use of lenses with more than about twenty-five diameters magnifying power. These were chromatic and spherical aberration. No single lens will focus absolutely, because while the density is constant the angles at which the rays strike the surfaces increase steadily, as they are farther from the axis, so that the effects illustrated by Fig. 31 are exhibited by the lens as shown in Fig.

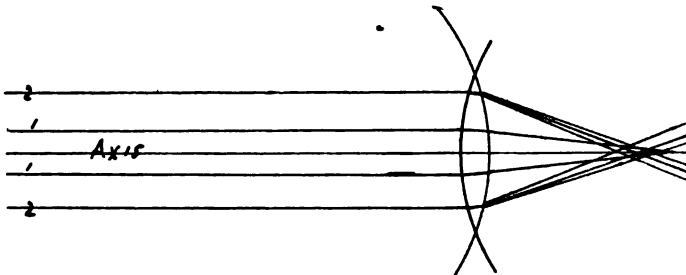


Fig. 32

32, the rays 1 and 1 show no aberration, while rays 2 and 2 illustrate, first, that the edge rays meet on the axis just a little sooner than the more central ones, thus, in high power lenses causing indistinct images to be formed; second, the dispersion would also cause color disturbances. The

discovery of the difference between crown and flint glass enabled the manufacturers to overcome both of these factors and thus utilize the whole field of the lens. Formerly it was necessary to rough-grind the marginal field to even partly overcome the difficulties.

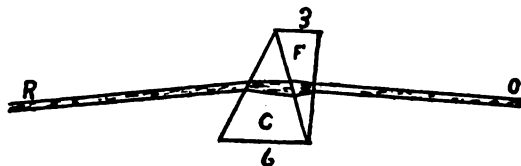


Fig. 33

Fig. 33 shows the dispersion of the ray from R in the crown glass, C, and the contrary effect in the flint glass, F, which reunites the parts, and the emergent ray becomes white again. The flint glass, 3, being half as strong in refractive power as the crown, 6, and of the same dispersive power, the result is a refractive power of 3 in the combination, without any dispersion. It is upon this principle that achromatic and aplanatic lenses are made. The first means the chromatic aberration is corrected, and the second is a lens in which all faults are overcome.

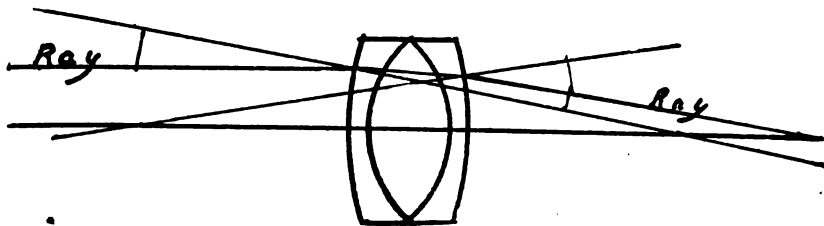


Fig. 34

Fig. 34 shows how an aplanatic lens is constructed; the center piece being of the formula C, while the two outer pieces are of the formula F, each having one-fourth of the refractive power of the inner piece. It would work just as well with reference to the dispersion if the two outer pieces were one, half as strong as the other, but by making two pieces and putting one on either side another defect was overcome, namely, spherical aberration, caused by the edge rays focusing sooner than the ones which pass through the lens near the center. Remember there are two laws which govern the amount of refraction by lenses: that of density and that of angle at which rays strike the surfaces.

Now we may see, with the aid of Figs. 35 and 36, the objects of a toric lens. First, understand that in architecture a tore is an ornament placed on pillars; it would be well illustrated by putting a bicycle tire around a large pillar, showing its long curve around the pillar and its short curve around itself; hence a toric lens is so named because it has not a spherical curvature but is curved in all meridians. It also illustrates aptly a natural law that in non-spherical surfaces the two principal meridians are always

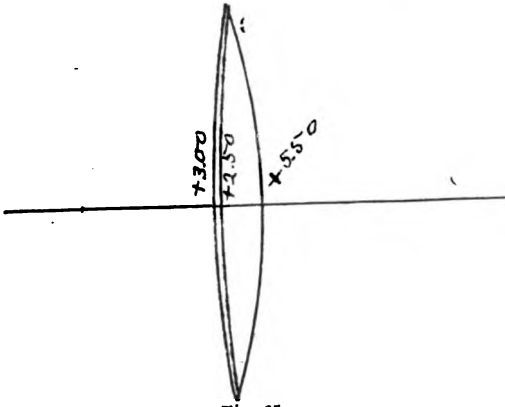


Fig. 35

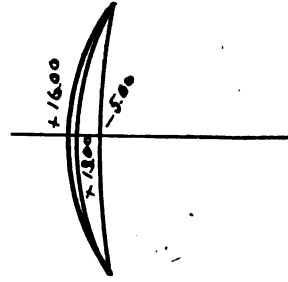


Fig. 36

at right angles to each other, and when they are taken care of the other meridians are also provided for without further attention. Yet there are alleged scientific oculists and opticians who prescribe and make cross-cylinder lenses with axes not at right angles to each other, and when criticized declare, "Well, I get better results from them anyhow," thus clinching the proof they do not know their business.

Fig. 35 shows how a sphero-toric lens is made where the two principal meridians are $+11.$ and $+8.$ respectively. Add all three figures together to get the maximum power and add the $+5.50$ and $+2.50$ to get the minimum power. When the student is familiar with prescription writing, as detailed later, this will be more comprehensive. Fig. 36 shows how a sphero-toric can be and often is made, which aborts the purpose for which nature gave the principle. By first grinding $-5.$ on one side there was caused a necessity for $+16.$ curvature in the meridian of maximum need, to get the $+11.$ required, and for $+13.$ in the meridian of minimum need to get the $+8.$ when the facts illustrated by Fig. 34 prove that the whole object in making lenses as flat as possible to get the desired effects is because the nearer flat they are the nearer perfect they are. Nature made the crystalline lens of the eye on the same principles as the aplanatic lens shown here, and, I believe, for the same reasons, hence I assert that the rod-and-cone theory of color-blindness is wrong, that most cases of color-blindness are color ignorance and the remainder are due to homogeneity of the lens structure.

Fig. 37 shows how a plano-convex lens focuses parallel rays at the opposite side of the circle of which the lens is a segment. This would be true of any size circle or globe of glass and from this fact the system of numbering lenses was evolved. The word "meter" means "measure," hence a circle one meter in diameter was chosen as the standard and all lenses are numbered inversely as their focal power in inches equals meters or parts of meters. The numbers apply to — lenses as they neutralize their

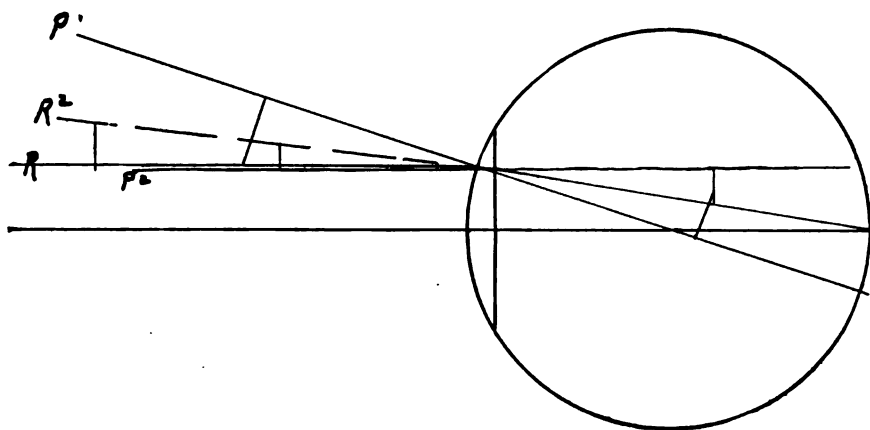


Fig. 37

equivalents in +, for the — are only positive by reflection, as shown in Fig. 16. Thus having a standard,

- No. 1.00 curvature equals 1 meter focal power.
- No. 2.00 curvature equals 1-2 meter focal power.
- No. 3.00 curvature equals 1-3 meter focal power.
- No. 4.00 curvature equals 1-4 meter focal power.
- No. 5.00 curvature equals 1-5 meter focal power.
- No. 6.00 curvature equals 1-6 meter focal power.
- No. 7.00 curvature equals 1-7 meter focal power.
- No. 8.00 curvature equals 1-8 meter focal power.
- No. 9.00 curvature equals 1-9 meter focal power.
- No. 10.00 curvature equals 1-10 meter focal power.

The metric system is a decimal system of weights and measures used almost universally. Its unit is 1 meter, the ten-millionth part of one-quarter of a meridian circle of the earth.

- 1,000 meters = 1 kilometer.
- 100 meters = 1 hectometer.
- 10 meters = 1 decameter.
- 1 meter = 1 meter.
- .1 meter = 1 decimeter.
- .01 meter = 1 centimeter.
- .001 meter = 1 millimeter.

As many are not familiar with the metric system, except as we use it in money, and few know it is subdivided metrically, I would explain that a meter is 39.368 inches, or, for mental calculations, call it 40 inches. Then

- No. 1.00 curvature equals 40 inches focus.
- No. 2.00 curvature equals 20 inches focus.
- No. 3.00 curvature equals 13 inches focus.
- No. 4.00 curvature equals 10 inches focus.
- No. 5.00 curvature equals 8 inches focus.

and so on. Having the number, to find the focus, divide it into 40; or, having the focus, to find the number, divide it into 40. Thus, 15 inches focus divided into 40 goes 2 2-3 times. Express it decimally as 2.66, leaving out the small fraction. Then remember the standard is not quite 40 inches, but is exactly 1.00 and that 1.00 cut into eighths would be .12 1-2, .25, .37 1-2, .50, .62 1-2, .75, .87 1-2, 1.00. We arbitrarily call the 2.66 a 2.62 because lenses are ground only to eighths. A No. .50 would go into 40 just 80 times, hence the focus of a + .50 lens would be twice as far as + 1.00 and that of a + 2.00 would be half as far as plus 1.00, or 20 inches. Thus having any figure in one column, to find its equivalent in the other, divide it into 40. Or, to be more exact, divide it into 39,368.

The rule of calculation of indices, curvatures and focuses is: Having the focus desired and the index of refraction, to find the radius of curvature necessary, multiply the focus by the index less 1.00. Thus the focus of a No. 1.00 lens is 39.368 inches; the index of refraction of glass is 1.53. The .53 being in excess of the standard, air, is what we use. $39.368 \times .53$ equals 20.86504 inches or the radius of curvature upon which the lens must be ground. Or, being given the radius and index, to find the focus, divide the radius by the index less 1.00. Or, being given the focus and radius, to find the index, divide the radius by the focus and add 1.00. If a biconvex is wanted the two radii must be twice as great as for a plano-convex; or if a meniscus is wanted the radius must be shortened; thus if + 10 is to be made meniscus form, with - 1.25 on one side, the radius of the + curvature would have to be shortened to make + 11.25 effect, so the - 1.25 would be neutralized and leave the full + 10.

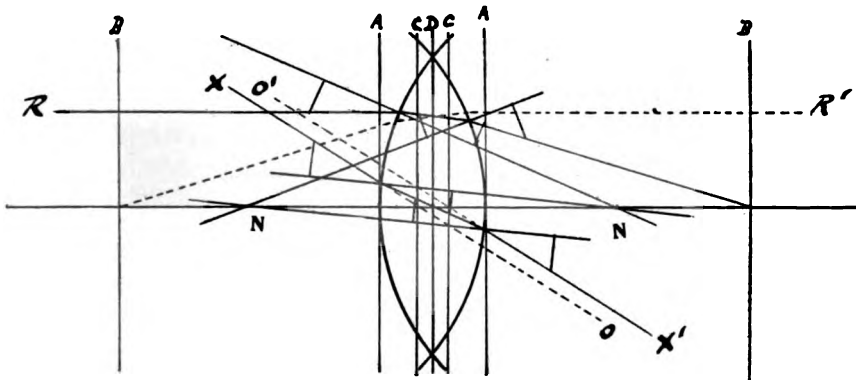


Fig. 38

Fig. 38 shows the principal points and planes of a bi-convex lens. The points are all on the axis and the planes are the vertical lines crossing the axis at the points. A and A' locate the principal points and planes:

B and B', the principal focal points and planes; C and C', the optical nodal points and planes; D, the optical center and its plane. N and N' are the true nodal points, or centers of curvature of the respective surfaces, from which the perpendiculars are drawn. The lines R and R', show how rays approaching parallel to the axis will be focused at the principal focal points. The line X to X' shows how the secondary axial rays suffer refraction, and locate not only the optical nodal points, but the optical center; X passing in the direction O is refracted, crosses the principal axis at the optical center and passes away to X' as if it came from O'. The nodal points are where the rays X and X' would cross the axis if they did not suffer refraction. It is of no great importance, but is of passing interest.

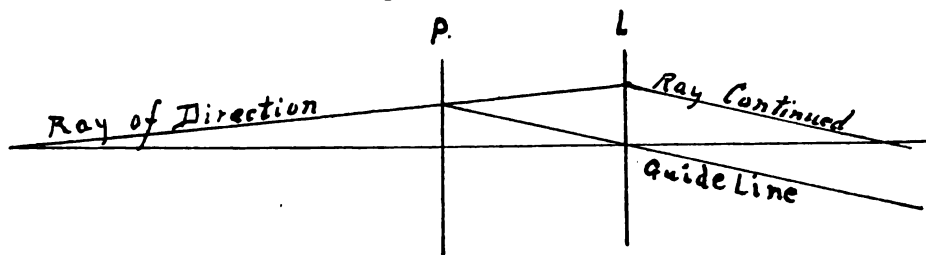


Fig. 39

Conjugate foci are those points on either side of a + lens at which are situated an object and its image. If an object be placed at the point on the left, Fig. 39, and the ray of direction drawn to the lens L through the principal focal plane P, then a guide line be drawn from the point where the ray crosses the focal plane through the optical center of the lens, then the ray continued parallel to the guide line, the point where it meets the axis will be the location of the image. It makes no difference where the ray of direction is made so it hits the lens. The reason this works exactly is that any ray starting divergent from the axis at the point where the line P crosses, will be refracted and pass away parallel to the axis, and any ray starting from any point on that plane, divergent from its secondary axis, represented by the guide-line, will be refracted and pass away parallel to that axis.

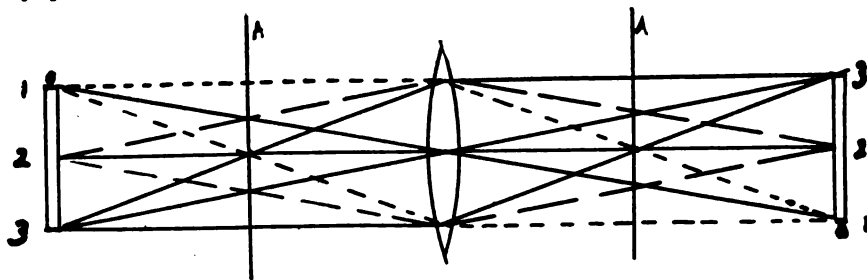


Fig. 40

Fig. 40 shows how the law of conjugate foci works in producing the

image. The direct rays from 1 to 1 and from 3 to 3 are secondary axes and the divergent rays from each converge to the corresponding figure on the other side for the same reason that those from the principal axis 2 converge to it again at 2 on the other side. The fact that the secondary rays cross the principal axis at the optical center accounts for the reversal of the image. There is a multitude of secondary axes, but the extreme ones given show how they all act. If an object be placed at twice the principal focal distance from any lens the image will be formed at the same distance on the other side; if the object be at three times the focal distance the image will be nearer and half size; if object is at four, five, six, etc., times the principal focal distance, the picture will be nearer and proportionately smaller until the object is at infinity, when the image will be at the principal focal point on the other side. Infinity is the distance sufficient so that any greater one makes no perceptible change in the location of the image; fifteen or twenty feet fairly expresses it. If the object be placed nearer than twice the focal distance the image will be farther away and enlarged. If the object be placed nearer the lens than the principal focus, the rays will be divergent after passing it and there will be no image. The point upon the principal axis where the object is placed is the first conjugate focal point, and the corresponding point on the other side of the lens, where the image is formed, is the second conjugate focal point, and the distances between each of those points and the lens are, respectively, the first and second conjugate focal distances. A rule to locate where images will be formed is to multiply the first conjugate focal distance by the focal length of the lens and divide the product by the difference between the two first figures; the result will be the second conjugate focal distance, which, in + lenses is always on the opposite side of the lens. The word "conjugate" means "yoked together," and it is applied to the points described because they are movable, the position of the second being always dependent upon the first. A better rule is to express the first conjugate focal distance in diopeters, deduct it from the power of the lens and convert the remainder into inches. Having both conjugate foci to find the power of the lens, express both in diopeters and add them.

Fig. 41 shows how a — lens forms images by reflection. Rays 1 and 3 are reflected as 2 and 4, while the principal axial ray is reflected back on its own line; 5 is reflected as 6, and others, not shown in the cut, fall in between, forming the image reversed. Other writers have misled readers by showing with Fig. 40 that + lenses form "real images reversed," and by Fig. 42 that — lenses form "virtual images erect," which is not true, as the student may determine readily if he will take two lenses, one + and one —, look through each at some object, preferably a light at some distance, when he will see a "virtual" erect object with either, en-

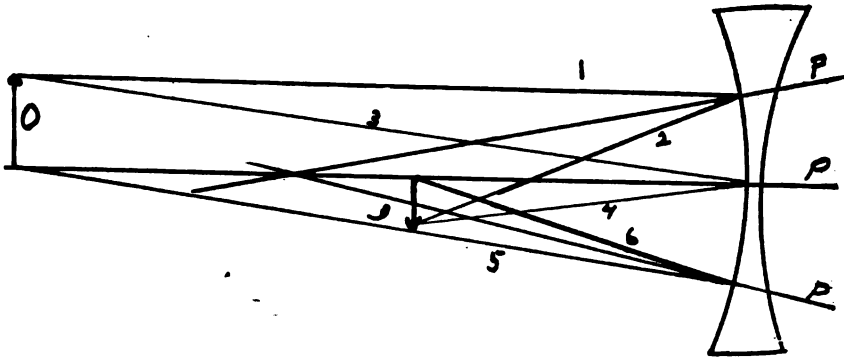


Fig. 41

larged with the + and reduced with the —. Then by holding a piece of blank paper with the + lens between it and the light he will find a “real” image inverted; next hold the paper between the light and the lens but a

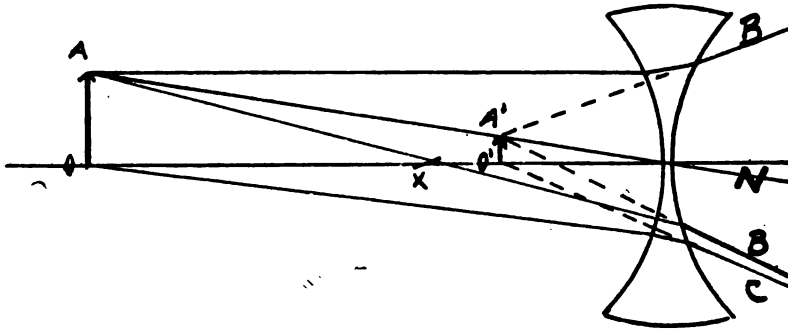


Fig. 42

trifle lower and tilt the lens so it will reflect on the paper and he will see another “real” image, inverted, too.

If the effect of the combinations of spheres, placed some distance apart, is wanted, make a drawing like Fig. 43. L^1 and L^2 represent the

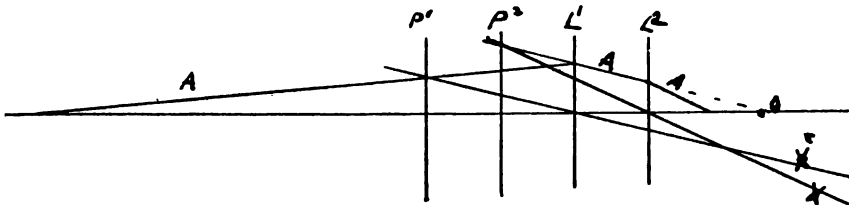


Fig. 43

lenses; P^1 and P^2 represent the respective focal planes. In this cut the lenses are each + 3.25 and 1-16 inch represents an inch, thus the lenses are 6 inches apart. The incident ray A approaches L^1 divergent and crosses its principal plane P^1 , in its course. For the reasons shown in Fig. 39 the ray would be refracted by L^1 and pass toward L^2 parallel to the guide line

X drawn from the principal focal plane through the center of L^1 ; then projecting it backward on its new course until it strikes the plane P^2 , drawing a guide line X from there through the center of the second lens, and continuing the ray parallel to it until it strikes the axis, there will be the conjugate focus with the point from which the incident ray, A, started.

If the ray A approached parallel with the axis and the power of the lenses is known its course from the first to the second lens may be drawn arbitrarily, then proceed as above.

Fig. 44 shows another class of lenses, in which the prisms are arranged on either side of a line, instead of around a point; bases are at the line for + and apices at the line for —. These are called cylindrical lenses, because, if the curvature of the + were continued they would form cylinders. Rays passing through on the lines marked "axis" suffer no refraction, but all others do. A + cylinder refracts all rays on either side of its axis, toward the line, thus what is termed the "focus" of a cylinder is

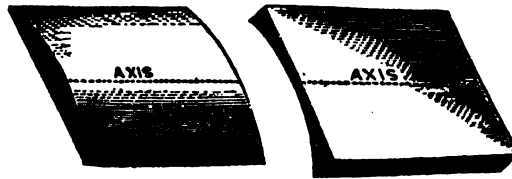


Fig 44.

merely causing a lot of rays to form a wedge, the thin part being on the axis and the wide part being equal to the extreme width of the lens. A — cylinder refracts rays from its axis, hence can only form a wedge of light by reflection. Cylinders are numbered as spheres are because in the meridian of greatest power of each they are equal to spheres of the same curvature. They are made only in the forms plano-convex and plano-concave because of the frequent necessity of combining them with sphericals to make what are called sphero-cylinders, or compound lenses. In toric lenses the sphere and cylinder are ground on the same side of the lenses. The points to be noted particularly with reference to cylinders are that there are two principal meridians, at right angles to each other; one is the axis, the other the meridian of maximum power; therefore in combining them with spheres, they impart that quality to the combination, the sphere furnishing all the power on the axis and both supplying power on the opposite meridian, where, if both have the same sign they must be added, and if of opposite signs they must be subtracted; if of opposite signs and of the same power they neutralize each other and the combination can be duplicated with a simple cylinder. See next chapter for this work.

Hold a prism, base down, a few inches from the eye, and look through it at some fixed object; there will be an apparent displacement of the object toward the apex of the prism, because the rays are broken toward the

base. Move the prism from right to left and reverse, when there will be no movement of the object. Rotate the prism and the object will move in a circle with the apex of prism.

Hold a + sphere in the same manner and there will be no displacement, because there are a great many prisms arranged around a center. The object may appear enlarged more or less, governed by the distances. Move lens to and fro and the object will be displaced in the opposite direction. Rotate the lens and the object will remain stationary.

A — sphere treated in like manner causes the object to move with it, otherwise it will be just like the +.

A + cylinder, held axis go and moved up and down will not displace the object; but when moved to and fro will displace the object in the opposite direction. Rotate it and the vertical meridian will go against the movement, while the horizontal meridian will go with it. This is because the apices of the cylinders are down on one side and up on the other.

A — cylinder, axis go, will cause no motion of object when moved up and down, but moved sidewise will cause a movement with the lens. Rotated it will cause the vertical meridian of the object to move with its motion while the horizontal will reverse, for the same reasons given for the + cylinders.

The prisms being reversed the effects are also as a matter of course.

Knowing the peculiarities of each lens in its simplest form it is easy to find how many departments to a lens. For example, if a lens be shaken and objects move in every direction it is proof there is a sphere; if, in addition there is greater movement in one principal meridian than in the other it tells there is a cylinder, or if rotating distorts objects it tells of a cylinder; while if rotating moves the object in a circle, but does not distort it, a prism is present. If all the effects are there, all the causes are also.

This exhibition of law affords us a lesson in practice. We must know what symptoms, objective or subjective, mean, then if we find several symptoms we know there are several causes. Our symptoms are not like those of the old schools, a sort of guide to diagnosis only, but to complete analysis.

PREScription WRITING.

Analysis and Neutralization of Lenses Prove a Simple Natural Law.

A + lens which brings parallel rays to a focus at one meter (39.368 inches) beyond it is taken as the standard of measure and is numbered 1.00. When the power is increased the focus is shortened; thus + 2.00 will focus at $1/2$ the distance + 1.00 does; + 3.00 at $1/3$; + 4.00 at $1/4$, etc. For mental calculations, remember + 1.00 equals 40 inches focus.

As + 1.00 is the number, and 40 inches the focal length, of the unit of measurement, if we have the number of a lens and want to know its focal length we divide the number into 40, and the result is the figure desired.

If we have the focal length and want the number, we divide 40 by the focal length and the result is the number. + 2.50 is of 16 inches focal length, because 2.50 is contained in 40 sixteen times. A lens of 10 inches focus would be + 4.00 because 10 is contained in 40 four times.

Lenses are not made in smaller fractions than eighths, so that when a figure is divided into 40 and the result is not in eighths we put it in the class to which it is nearest. For example, a 15-inch focus would give number $2.66 \frac{2}{3}$ when the calculation is made thus: 40 divided by 15 equals $2.66 \frac{2}{3}$. As 2.625 is the nearest, we so class it. It is customary to ignore the third figure in the decimal expression, so the number would be 2.62 or 2.63.

In practice it is rarely ever necessary to use smaller fractions than quarters, because, if the eye is below normal, so that + lenses are required, it should be given full correction, or a little more; and if it is above normal, so that — lenses are used, it should be undercorrected. That is, if + 1.12 is called for by the test, give + 1.25; if — 1.12 is the test, give — 1.00.

The word "Dioptre" means "to see through," hence it was chosen as the name for the unit of measure.

As has been shown in the chapter on refraction, — lenses are negative quantities, made by reversing the order in which prisms are used for +, therefore, the numbering applies to both. Also to cylinders.

It is easy to tell + from —, because if a + lens is held between the eye and an object and moved back and forth to right and left, or up and down, or moved back and forth between the eye and the object, the object will appear to move in the direction opposite to that in which the lens is moved, and the stronger the lens the more decided the motion. Take — lenses and the motion is with the movement of the lens.

Spherical lenses have equal power in all meridians, while cylindricals have power only when moved across the line corresponding to the axis. To find the axis of a cylinder, hold it between the eye and some straight

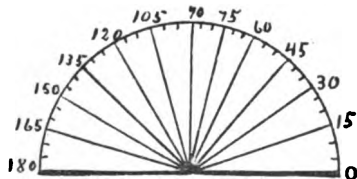


Fig. 45

object and rotate it. The object will appear distorted in shape except when either the axis or the meridian at right angles to the axis is on the line corresponding to the correct position of the object. Having found that position, move the lens sidewise and up and down, the meridian where there is no motion to the object is the axis. Make a mark on the edge of the lens showing where the axis is, then lay the lens flat on Fig 45, center over cen-

ter, and read the meridian from the figures. The inside of the lens must be down if the axis is oblique, otherwise an axis which is really 60 will register 120, or as far on the other side of 90; axis 45 would register 135; axis 15 would register 165, etc.

Sphero-cylinders will cause the object to move in all directions, but in one meridian there will be the greatest, and in the one at right angles to it, the least motion. Locate the two principal meridians as described in the case of cylinders.

Sphero-cylinder-prism or sphero-prism lenses will cause, not only the movement described for sphero-cylinders, spheres or cylinders, but the prism will displace the object toward its apex. The prism, base reversed, which replaces the object, is the measure of the prism in the lens. If the prism in the lens is base in it will require the same degree of prism, base out, to neutralize it.

A prism alone will not distort or move objects seen through them, except as the prism is rotated it will hold the virtual object in perfect shape, constantly in line with the apex.

To ascertain the number of a lens use lenses of the opposite kind which have the numbers on them, to neutralize the one unknown. If a $+$ lens of unknown power be neutralized with a -1.00 sphere we know it must be $+1.00$. If a $+1.00$ cylinder axis 90 stops all motion in a $-$ cylinder we know it must be -1.00 axis 90. If we have a $+$ compound (sphero-cylinder) and $-1.00 -1.50$ axis 45 neutralizes it, we know it is $+1.00 +1.50$ axis 45. If it is a compound and $+1.00 -2.50$ axis 180 neutralizes it we know it is $-1.00 +2.50$ axis 180. There are such things as crossed-cylinders, but people who understand their business never have any use for them, except in the very rare instances where the astigmatic error is so great that a sphero-cylinder would give more spherical and chromatic aberration. Even then, the sphero-toric lens (one in which there is a spherical curvature on one surface, and both a spherical and cylindrical curvature on the other) is better in most cases. It is a fact, however, that all compound lenses are cross-cylinders in effect.

One of the most important features of optical work is the writing of prescriptions correctly, yet more errors are committed in this respect than in any other, except, possibly, the prescribing of $-$ lenses where $+$ should be used.

The incorrect writing does not affect the result so far as the patient is concerned, but it frequently involves more work for the optician who grinds the lenses. For example: a combination written $+2.00 -2.50$ ax. 180 means a $+$ spherical lens is combined with a $-$ cylindrical with its axis at 180, or the horizontal meridian.

In analyzing this we must remember that the 180 is not a lens, but is the particular meridian upon which the axis of the cylinder is placed, and

signifies that the cylinder has no power there. Next, we must remember that spherical lenses have power in all meridians equally, so the power of the combination on the horizontal meridian is furnished entirely by the spherical, and is, of course, $+ 2.00$. Next, the other principal meridian is always at right angles to the first, which makes it the 90th meridian; on this line both lenses have power, and as one is $+$ while the other is $-$, the real effect is only the difference between them. The $-$ being 2.50 while the $+$ is only 2.00, the balance is in favor of the $-$ by .50, so, when the combination is made into a lens the power in its two principal meridians will be represented by Fig. 46.

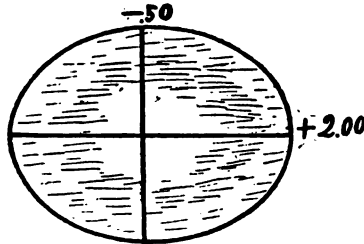


Fig. 46

Had the prescription been written $- .50 + 2.50$ ax. 90 the effect would be the same, because now the axis of the cylinder is vertical, and it has no power on its axis, while the $-$ sphere, having power in all meridians takes full effect on the vertical, and on the opposite meridian the $+ 2.50$ neutralizes the $- .50$ and has $+ 2.00$ remainder.

Manufacturing opticians carry what they call blank cylinders in stock; that is, a square piece of glass with the cylinder ground on one surface, and grind whatever sphere is desired on the other side, then lay a pattern on and cut the lens so the axis of the cylinder is at the proper meridian. In the prescription as written first it would require the grinding of $+ 2.00$ while as written last it would only require $- .50$, a saving of three-fourths of the work. If all practitioners would observe these points it would facilitate greater speed in filling their prescriptions and often result in lighter weight lenses.

$+ 1.00 + 1.00$ ax. 90	}	or any other axis, would be correct, because the signs are alike; or, differing, the cylinder is at least twice as strong as the sphere.
$+ .50 + 1.50$ ax. 45		
$+ 1.00 + .75$ ax. 60		
$- 1.00 - 2.00$ ax. 120		
$- 2.00 - 1.50$ ax. 75		
$- 1.00 - 1.00$ ax. 150		
$+ 1.00 - 2.00$ ax. 135		
$- 1.00 + 2.00$ ax. 165		
$+ 1.00 - 3.00$ ax. 180		
$- 1.50 + 4.00$ ax. 140		

+ 1.00 — .50 ax.	60	} or any other axis, are wrong, because the signs differ, and the cylinder is less than twice as strong as the sphere.
+ 1.50 — 2.00 ax.	180	
— 1.00 + 75 ax.	90	
— 1.00 + 1.50 ax.	45	

The meridian given as the location of the axis of the cylinder is called the first principal meridian and the one opposite to it is the second principal meridian.

As lenses are to supply deficiencies and neutralize over-developments of the dioptric systems of the eyes, it is in order to explain some of the physical qualities of those organs here. Normal and defective eyes are named, respectively, emmetropic and ametropic. The latter are divided into two classes, the deficient ones are hypermetropic, or hyperopic, while the over-developed ones are myopic. The first are sometimes called far-sighted and the latter near-sighted. The reasons will be found in the chapter devoted to refraction and accommodation of the eyes.

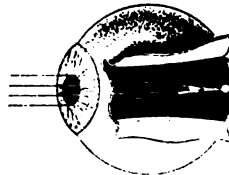


Fig. 47

Fig. 47 shows how the retina of the emmetropic eye is situated at the principal focus of the dioptric system. This eye requires no lens because its focus is right without it.

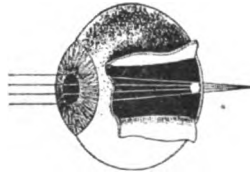


Fig. 48

Fig. 48 shows the retina of a hyperopic eye in front of the principal focus, because the eye is too short on its axis, or because the cornea or lens, both, are of deficient curvature. This eye needs a + lens to shorten the focus by increasing the power of the apparatus.

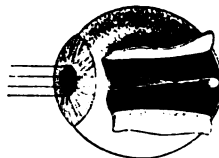


Fig. 49

Fig. 49 shows the retina of a myopic eye behind the principal focus, because the eye is too long on its axis, or because the cornea or lens, or

both, are of too great curvature. This eye needs a — lens to lengthen the focus by neutralizing the excess power of the dioptric system.

In many cases the cornea is not of spherical curvature, but is not irregular, and it is one of Nature's laws that all non-spherical, regular curvatures have two principal meridians, at right angles to each other. In architecture such a surface is called toric. It is well illustrated by a bicycle tire which has a long curve around the wheel and a short one around the tire. Imagine a piece of glass like that and it is easy to see the shortest curve would focus sooner than the long one, hence if light was permitted to pass through the whole surface of a lens at once there would be no focus.

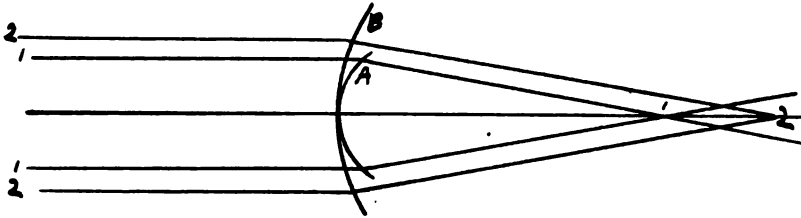


Fig. 50

Let Fig. 50 represent the curves of the two principal meridians of a lens A being the vertical and B the horizontal. The rays 1 and 1 would focus at 1 and the rays 2 and 2 would focus at 2. This lack of common focus is called astigmatism, meaning without a point. When an eye presents such a surface to rays, vision is, of course, more or less impaired, owing to the amount of the difference between the two principal meridians; sometimes there is so little difference it is not worth correcting, as will be shown in the chapter on measuring errors of refraction.

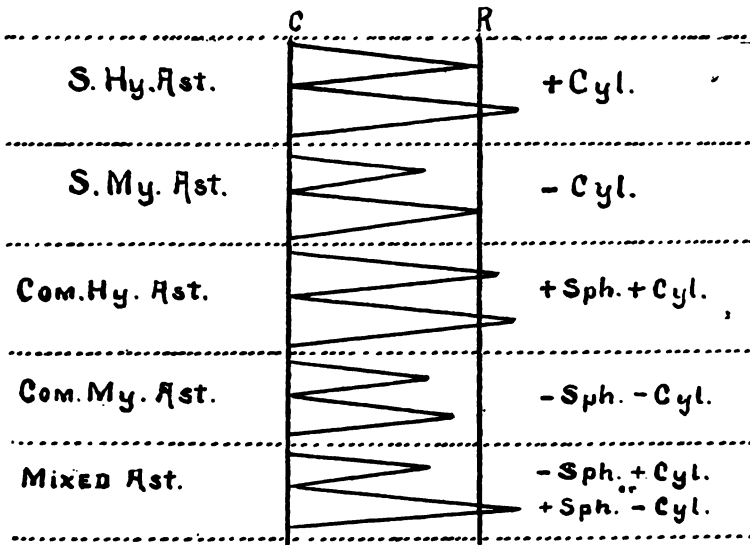


Fig. 51

There are five different forms of regular astigmatism: Simple and

compound hyperopic, simple and compound myopic and mixed. Fig. 51 shows the principal focal points of the two principal meridians in each case; the myopic meridians focus too soon, the normal ones at the line R, and the hyperopic ones beyond the lines; the first ones require — lenses, the second, none, and the third, + lenses; the amount of astigmatism is the distance between the two points. In mixed astigmatism one meridian is myopic and the other hyperopic.

Having seen that a cylindrical lens has no power on its axis, we have a law by which we analyze compound prescriptions, and it is essential to practice that it be understood perfectly, because by our method of fitting with or without clycloplegics we must nearly always transpose the prescription, as it comes from the trial frame, to get it in its simplest form. Sometimes it comes from the frame a compound and we transpose it into a simple cylinder. The two principal meridians, when drawn on paper form a cross, hence, in proceeding by the law we do one step at a time. If we take care of the two principal meridians, Nature will take care of the rest.

1st step: Draw a line representing the meridian designated as the axis of the cylinder.

2nd step: Write at one end of that line the sign and power of the sphere, because it is the only part of the combination that has power, (viz., curvature) there.

3d step: Draw a line representing the other meridian which is always at right angles to the first and is 90 degrees from it on the circle; if the first is below 90, add 90 to find the degree; if the first is above 90, subtract 90. Thus if the first is 40 the second will be 130; if the first is 120, the second will be 30, etc.

4th step: Write at one end of the second line the effect of the two lenses; if both are + or both are —, add the figures and give the sign; if one is + and the other —, subtract the less from the greater and use the remainder, giving the sign of the greater; if the signs differ but the power is equal of course there is nothing to be recorded and we put it 0.

5th step: Make a diagram of the focal points of the two meridians as shown in Fig. 51.

6th step: Begin writing the new prescription by writing, for the spherical part, + or —, whatever is needed for the meridian nearest normal.

7th step: Change the focal point to the line R, as the lens would do it, and change the focal point of the other meridian the same amount in the same direction.

8th step: Write for the cylindrical part, + or — cylinder of sufficient power to put the other meridian on the line R also and write for the axis the number of the meridian corrected by the sphere.

This law always works. If a prescription is written correctly it will

prove it, and if wrong it will correct it. To prove the correctness of a transposition put the new prescription on a cross by steps 1, 2, 3, 4, then if it corresponds with the cross made from the original prescription and the cylinder is still of the same power, it is proved.

A short way to transpose a prescription that needs it is to take the difference between the powers of sphere and cylinder for the new sphere, then use the power of the old cylinder, but change the sign and reverse the axis.

No prescriptions need transposing unless the signs differ and the cylinder is less than twice as strong as the sphere.

It is always a case of mixed astigmatism when the signs differ and the cylinder is the least bit stronger than the sphere.

It is always a case of simple astigmatism when the signs differ and the cylinder is of the same power as the sphere.

It is always a case of compound astigmatism when the signs differ and the cylinder is weaker than the sphere.

The following examples will show the process of working out transpositions: Some people, who want to be mysterious, write a prescription like this:

$$+ D. S. 1.00 \text{ } \odot + D. C. 2.00 \text{ ax. } 90.$$

D. for diopter, S. for sphere, $\odot$ for combined with, D. for diopter, C. for cylinder. We know that the first lens, having no axis written, must be a sphere, and the other having an axis, is a cylinder. Being written together, a compound is intended, thus, $+ 1.00 + 2.00 \text{ ax. } 90.$

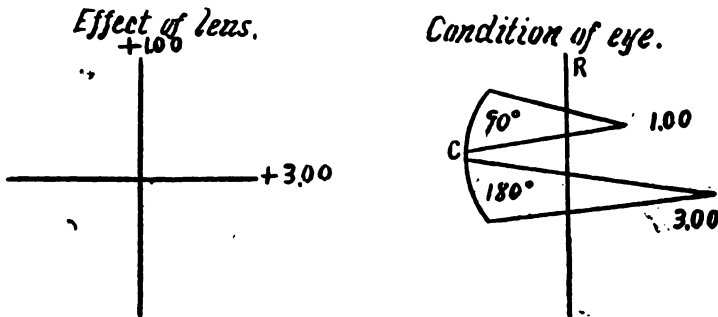


Fig. 52

Following the law, step by step, the prescription comes out as it went in, hence must be correct, and by Fig. 52 we see it is compound hyperopic astigmatism.

$$L. + 3.50 - 3.50 \text{ ax. } 180.$$

Another,

$$R. + 4.00 - 5.00 \text{ ax. } 30.$$

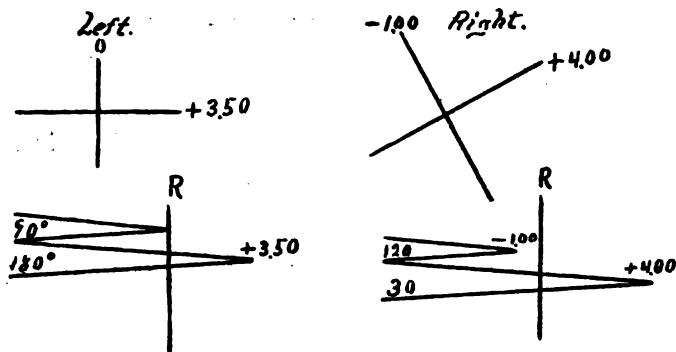


Fig. 53

The left eye shows (Fig. 53) the 90 meridian is normal, so we write for it a simple cylinder, $+ 3.50$ ax. 90, because we must have the power at 180 and the power of cylinders is always across the axis. For the right eye we write $- 1.00$, which puts the 120th meridian on the line but drives the other 1.00 farther away so it must now have $+ 5.00$ cylinder, ax. 120, hence the prescription will read $- 1.00 + 5.00$ ax. 120. That for the left eye shows simple hyperopic astigmatism, while the right shows a case of mixed astigmatism.

Another, $- 2.00 - 1.00$ ax. 180.

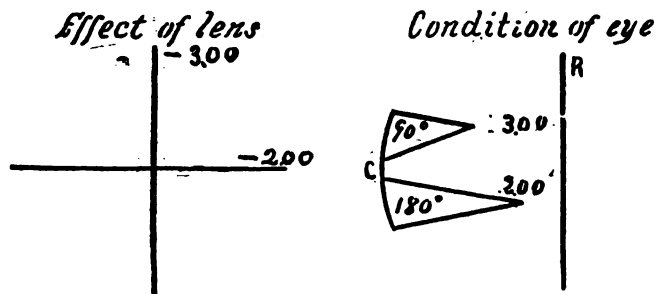


Fig. 54

Analysis shows the original to be correct and Fig. 54 shows compound myopic astigmatism.

Another, $+ 2.00 - 3.00$ ax. 135.

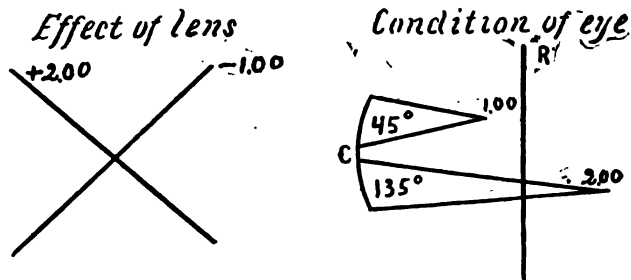


Fig. 55

Analysis, (Fig. 55) shows $-1.00 + 3.00$ ax. 45° , a case of mixed astigmatism.

Another, -5.00 ax. 180° .

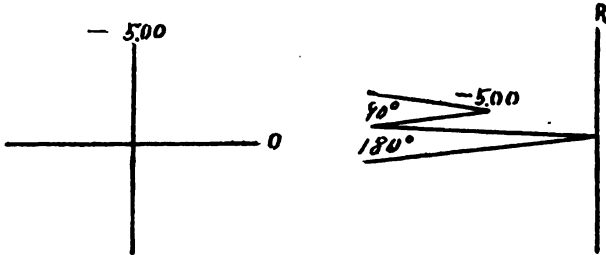


Fig. 56

Being a simple cylinder of course there is no transposition. A case of simple myopic astigmatism, Fig. 56.

Another, $L + 1.50 - 3.00$ ax. 155° .

$R + 1.00 - 1.00$ ax. 180° .

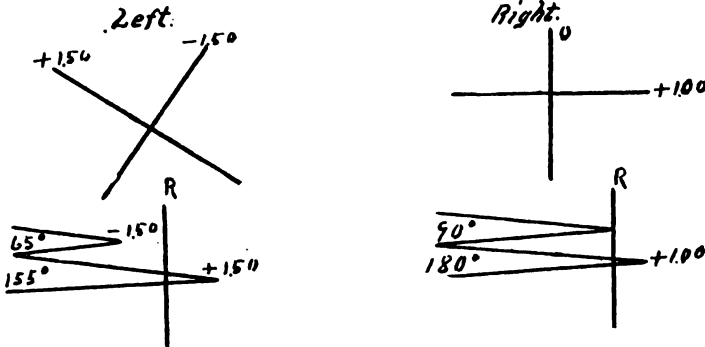


Fig. 57

Corrected, Fig. 57, $L - 1.50 + 3.00$ ax. 65° .

$R + 1.00$ ax. 90° .

Don't forget that transposing prescriptions and neutralizing lenses are two different propositions. In neutralizing, change signs but not axes.

There is always something to be learned.

Original ideas will always command a premium.

To lend a book is bad. To borrow one is worse.

No man ever knew so much that he couldn't learn more.

When you get near the "limit angle" look out or you'll lose your bearings.

People who are anxious to have the world look up to them ought to climb.

Speaking of theory and practice, a good many people seem to think any old notion is a theory.

CONDENSED ANATOMY. .

Head.....	Cerebrum, Mental..... Cerebellum, Physical..... Weighs 4 lbs Cerebrum $\frac{3}{4}$ Cerebellum $\frac{1}{8}$
Thorax.....	Lungs..... Right, 3 lobes; weighs 22 oz. Left, 2 lobes; weighs 20 oz. Heart, $5 \times 3 \frac{1}{2} \times 2 \frac{1}{2}$ in.; weighs 8 to 12 oz.; capacity 16 tons daily. Stomach, $13 \times 5 \times 3 \frac{1}{2}$ in.; weighs 4 to 5 oz.; capacity 3 to 5 pints; secretes 6 to 8 lbs. gastric juice daily; coarse digestion; extracts elements for crude blood and delivers to spleen and portal vein. Spleen, $5 \times 3 \times 2$ in.; capacity 6 to 10 oz.; makes crude blood. Duodenum, 10 in. long, shaped like a shepherd's crook laid on its side, short end up, where it is attached to the stomach at the pylorus; it is a second stomach and is assisted by the pancreas and gall-bladder secretions. . Liver, $12 \times 6 \times 3$ in.; weighs 4 lbs.; secretes 20 to 40 oz. bile in 24 hours; excretes sugar and urea from crude blood sent from stomach and spleen by portal vein, preventing kidney troubles and auto-intoxication. Pancreas, $7 \times 2 \times 1$ in.; weighs 3 oz.; secretes 20 oz. in 24 hours. Gall-bladder, $3 \times 1 \frac{1}{2}$ in.; capacity 1 oz.; secretes 20 to 24 oz. in 24 hours. Kidneys, $4 \times 2 \frac{1}{2} \times 1 \frac{1}{2}$ in.; weigh 5 oz. each; capacity 40 to 50 oz. in 24 hours; $1 \frac{1}{2}$ oz. solids; 300 to 500 grains urea; 1 grain of uric acid to 33 grains urea. More is bad. Supra-renal capsules, $1 \frac{1}{2} \times 2$ in.; weigh 1-16 oz. each; extract toxics from the blood; located on top of kidneys. Bladder, $5 \times 3 \times 5$ in.; capacity 1 pint; handles product of the kidneys daily.
Abdomen.....	Mesentery, folds of peritoneum attached to the intestines; organ of assimilation. Intestines..... Small ... Large.... Jejunum, 8 feet. Ileum, 11 feet. Cæcum, 2×3 inches. Colon, 5 feet; capacity 1 gallon. Rectum, last 6 inches of the intestines. Semeniferous tubules, in testicles. Epididymis, 20 feet duct wound in small space on top of the testes and connecting them with the Vas deferens, 2 feet long, which delivers the semen to the Vesiculæ seminales, two pear-shaped bodies, 2 inches long, on the inner surface of the bladder, next the rectum. Ejaculatory ducts, $\frac{3}{4}$ inch long into Urethra, 7 to 8 inches long. Prostate gland, $1 \frac{1}{2} \times 1 \times \frac{3}{4}$ inches; weighs $\frac{3}{4}$ oz.; secretes vitalizing fluid for semen. Vagina, 5 to 7 inches. Uterus, $3 \times 2 \times 1$ inches. Fallopian tubes, 5 inches each; calibre 1-10 inch. Ovaries, $1 \frac{1}{2} \times \frac{3}{4} \times \frac{1}{2}$ inch; weigh $\frac{1}{2}$ oz. each. Graafian vesicles, 1-80 to $\frac{1}{6}$ inch, contain Ova, each 1-120 inch. Pseudo prostate gland, a ring of muscle structure around the neck of the bladder in which is often found stricture and inflammation, similar to prostatitis, causing polyuria.

CLINICAL PORTION

THE EYES AS FACTORS IN ANALYSIS

McCormick Neurological College Methods Compared With Those of the Old Medical Schools.

The necessity for better general knowledge of eyes, their treatment and maltreatment is exemplified daily in the work of oculists and opticians. The public should be educated to know how to judge the service it gets. I have before me, as I write, a pamphlet entitled "A Symposium of Diseases of the Conjunctiva, by a professor of ophthalmology in Illinois Medical College." It is a reprint from a medical journal and is being circulated at this time with no other evident view than that of advertising the author, which I hold is legitimate, if he chooses to do it; but it is certainly a violation of the code of ethics, which forbids advertising, therefore it is inconsistent. But that is not the worst of it. Its contents are about as old as the hills and the practices advocated have been disproved abundantly. I also have before me a copy of "Diseases of the Eye," by W. Lawrence, F. R. S., bearing date 1834, and comparison of the two documents fails to note any difference between the old school methods of today and those employed seventy-one years ago, calomel for the stomach and bowels, with nitrate of silver and bichloride of mercury lotions being the principal treatments advocated in both. The older one used venesection, electricity, cupping and blisters applied to the nape of the neck, leeches, etc., while the younger only adds such philosophy as this: "The physician's judgment must be relied upon, for I can conceive of a word, even of caution, dropping into the ear of the skeptical, being capable of arousing grave suspicion in the patients' minds, producing endless annoyance to the physician. In this, as at many other times in the physician's life, 'A closed mouth maketh a wise head.'"

The younger one writes glibly of the varieties of conjunctivitis as catarrhal, phlyctenular, trachoma, contagious, epidemic, purulent, gonorrhoeal, croupous, vernal, follicular, diphtheretic, etc., and cites as causes everything from "staphylococcus pyogenes aureus" to a simple "cold in the head," which he hastens to explain is "coryza" lest some one will conclude he lacks education. But the elder leads him by several points, with "conjunctivitis catarrhalis," "conjunctivitis puro-mucosa atmospherica," etc.

That their treatment is experimental is proved by the younger in these words: "In some cases of trachoma, unfortunately, the recurrences are so numerous and so stubborn that time and opportunity permit the use of all the approved methods of treatment, and yet the diseases progress to ultimate loss of vision of one or both eyes." The older one testifies: "Under the head of chemical stimuli, or irritants, it would not be proper to omit the mention of numerous matters applied to the eye under the name of remedies. It would seem as if the most delicate and sensible organ of the body had been selected for the most violent applications. Powdered glass and sugar, wine and tincture of opium, electricity and galvanism, spirituous and ammoniacal vapors, are the mildest of the ordinary local stimuli. Subacetate of lead, white and red precipitate, nitrate of mercury, oxide of zinc, alum, the sulphates of zinc and copper, nitrate of silver, and oxymuriate of mercury, are applied daily to the eye in the form of solution and various other shapes."

That the profession has retrograded is proved by many things but this one illustration will suffice. Today, for overflow of tears, the oculists probe the nasal duct and call it a modern invention. It is as old as the devil. Dr. Lawrence, of seventy-one years ago, says: "I have never seen obstruction of the lachrymal canals except as a consequence of injury, operation, or the pressure of tumors; the use of probes, therefore, in reference to these canals, is unnecessary."

Neither of the writers referred to, and very few of the current books and periodicals ever refer to errors of refraction as even a possible cause of these wonderful (?) diseases. With them everything is "specific" cause and "specific" remedy, and out of their own mouths they are convicted of culpable ignorance of the anatomy and physiology, chemistry and mechanics of not only the eyes, but of the entire body.

The neurologist utilizes electricity in his practice, but not that of a galvanic battery or of an artificial dynamic current. He knows the nervous system of his patient is a natural dynamic and galvanic current and he knows that only mechanical or chemical causes can exist. He knows the mechanism of the accommodation and of the nervous system generally, and, as the true mechanic and chemist should, he looks for the most likely cause first, and goes along the line until he finds the cause or causes, removes them, when he knows the symptoms will disappear, with

reasonable care. He uses on the inflammations named so strenuously and treated so vigorously by the old and young fossils, nothing stronger than cold salt water and rest, with hot water applications in cases of suppuration, to keep the parts clean. And he gets good results every time. The water and salt are not used as treatment, in the sense the others use boric acid, mercury, etc., but in the sense that rest is prescribed; a simple matter of cleanliness and opportunity for the natural electric current to resume or assume a normal distribution.

It should be understood that the circulation of the blood, the action of the heart, lungs, and every function of every part of the body is produced and maintained by the action of the nervous system, positively and negatively. There must be a supply of nerve force equal to the demands, and its circulation must be rythmic, otherwise there will be the opposite, discord, and the symptoms will be as varied as the classes of people exhibiting them.

Normally the eyes require no nerve force other than the passive current which should be present at all times, to complete the functions of sensation and involuntary or subconscious motion, except when they are being used for near work, where, the average distance being thirteen inches the demand for voluntary purposes is 4.50 units in each eye. The unit having been called diopter elsewhere, will so be called here: The number of minutes devoted to near points, during the waking hours, averages three hours, therefore, a person with normal eyes uses for this purpose,

For Accommodation, L. 3.00

R. 3.00 6 D.

For Convergence, L. 1.50.

Automatically, R. 1.50 3 D.

9. D. per second.

$9 \times 60 \times 60 \times 3 = 97,200$ D. for 3 hours.

This is all used by the branches of the third cranial nerves to the ciliary sphincters and the internal recti; the other branches of the same nerves and the second, fourth, sixth, and ophthalmic divisions of the fifth, require so little during the entire day that nature adapts them to the situation and they suffer little or no irritation from the temporary increased current, merely increase their tension during the time, so we ascribe to them, in the absence of facilities to measure it exactly, a consumption of 2,800 D. daily, which makes the total demands of the normal eyes 100,000 D. daily. As they receive their currents through four and one-third pairs, 36 per cent of the twelve pairs of cranial nerves, or 10 per cent of the entire number of nerves in the body, it is a fair estimate to place the normal demands of the entire body at ten times as much, or 1,000,000 D. daily. This, if true, must represent the average capacity of the producing apparatus. In some people the demands are more and in some less than

the average, but in the first class there is danger of irritation and in the second of atrophy of parts from non-use. This is why the over-active person breaks down suddenly and the lazy person grows lazier slowly until he gets too lazy to breathe.

More than 99 per cent of all people are lacking in development of some part, and at least 90 per cent are deficient in the eyes. But, the eyes have an advantage over all other organs in that they can use the machinery placed therein for natural purposes, to conceal the defect, at least so far as vision is concerned, although it is a decided general systemic disadvantage as will be seen by the description of the defect known as hypermetropia or farsightedness and the effects of the efforts of accommodation.

The hypermetrope of 1.00 D. is one whose eyes are deficient to the extent they require + 1.00 lenses to make them emmetropic, or ideally perfect. In such cases, in order to see at a distance the accommodation is called into play 1.00 D. in each eye. Under natural conditions this demand would also require a convergent effort of .50 D. in each internal rectus, and it, therefore, comes automatically; but, as it is not needed in this instance it would create diplopia, so the controlling center in the brains sends to the external recti, by way of the sixth nerves, sufficient innervation to prevent the convergence, which, of course, must be .50 D. each. Therefore the demands of this hyperope are:

For accommodation,	L. 1.00	
	R. 1.00	2.00 D.
For Automatic Convergence,	L. .50	
	R. .50	
Negative pull through 6th	L. .50	
nerves to external recti.	R. .50	2. D.
4. D. per second.		

$$4 \times 60 \times 60 \times 16 = 230,400 \text{ D. for 16 hours work.}$$

All this only succeeds in accomplishing emmetropia, when the regular daily quota of 1,000,000 must be furnished for the average person. If the reader knows anything of the law of ratios and will observe that the estimates applied to the first are applied to the second without change, he will see at once, that while part of the figures are hypothetical, they are based on absolute fact in the first instance and the excess demand for hyperopia, being all fact, makes the ratio absolute so that no matter what future developments in the facilities for taking nerve measurements may occur, they cannot fail to establish the ratio, because mathematics is law, natural law, which reaches but one conclusion: A hyperope of 1.00 D. requires 23 per cent. above normal nerve supply.

Now for the effects: It will be admitted that no set of machinery

made by man could stand 23 per cent excess demands upon its capacity for any length of time and some may even declare that no infinitely made machine can do it either. With the latter I agree, but not to the extent of a general smash-up such as we would expect of an implement because Nature has arranged compensatory emergency apparatus through which not only are sent such danger signals as fever, pain, pallor, flushing, etc., but in extraordinary cases she suspends locomotion, or some other function sufficiently to incapacitate and intimidate the mentality in charge of an individual so that, at least temporarily, the excess demand ceases, when, by natural processes the supply is recuperated.

The mental exhibits of nerve strain to the point of irritation, from any cause, are irritability, unsteadiness of thought and action, lapses of memory, suspicion, insomnia, suicidal insanity. If the strain has reached the point of partial or complete exhaustion, the exhibits range from the above named in milder forms down to melancholia and imbecility.

The physiological exhibits are: Derangement of the digestive apparatus from simple acidity of the stomach to biliousness, constipation, piles, diarrhoea, intussusception or appendicitis, albumenuria, enuresis, amenorrhoea, dysmenorrhoea, chlorosis, incontinence, impotence and any of the old schools so-called bad diseases, beside headache, ophthalmia and the milder ills.

I do not believe anyone will have the temerity to deny these facts, although I am not so sure they will accept the following with complacency, nor do I care. I am ready for a clinical contest any time the objectors want it, making only one provision, viz.: that the public shall have the benefit of the results.

First, hyperopia is the primary cause, or one of the primary causes of nearly all human ills. Second, the ignorance of the general practitioner in this matter is disgraceful; that of the oculist, criminal.

The constant effort of the accommodation in hyperopia during waking hours, contrasted with the state of comparative rest in emmetropia, is, in itself, enough to cause irritation of the entire ciliary body in addition to the extra demands on the nerve supply. But that is not by any means the worst it does; and this the oculists do not appear to understand.

Electricians use the terms, volt, ampere, watt, ohm, etc. An ohm is the unit of resistance; a volt is the unit of electro-motive force; an ampere is the unit of measure of current, and a watt is one volt-ampere, signifying that two units are expressed in one. The ohm is based upon the resistance of a piece of pure silver wire one meter long and one millimeter thick. It is a law of electricity that the current varies directly subject to the electromotor force and inversely subject to the resistance. In the nervous system we have no department that is poised so delicately as the sphincter muscles and peristaltic apparatus. Therefore it is plain that ex-

cess wattage in the nervous system will always take the course of least resistance, which is in the departments named, because their natural elasticity tends to contract and they encourage the impulses toward themselves. This more particularly when the original demand is from one of them as it is in hyperopia. The constant demands of the accommodation keep a constant excess wattage on all wires and it finds its way to the nerves which operate the openings throughout the body, such as the mouth, the uterus, the anus, the bladder, the lachrymal glands, all secretory systems, and also to the canals such as the esophagus, the intestines, the lymphatics and the blood vessels. Now herein lies the secret of the troubles and the proof of the law referred to above: The direct or positive current goes out along the muscular walls of the arteries, subject to the electromotor force, but the return current being the subject of a weakened force behind it and a sustained and even increased resistance by way of the walls of the veins is retarded, thus blood is sent to the periphery faster than it can be returned and congestion of the vascular tissues in the vicinity of the sphincter nerves and muscles is only a natural result. Hence conjunctivitis, prostatitis, metritis, ovaritis, fallopianitis, amenorrhoea, dysmenorrhoea, menorrhagia, and so on down to the operating room, one of the most damnable and at the same time most beneficial places on earth. Not only that, but like all other + elements, this path of least resistance becomes a negative quantity after it passes its limit angle and the spasm, which produced the conditions above, involves peristalsis of the intestines, interferes with egestion, this affects digestion. this, in turn, refuses to accept the products of the liver, it becomes clogged, leaving more for the kidneys than they can do and the results are nephritis. blood poison and other symptoms termed, ridiculously, diseases. I say ridiculously, because disease is merely a state or condition, an effect, while old school doctors insist upon viewing diseases as causes. As I have shown elsewhere in this work, they make them the sole object of treatment while neurologists use them only as guides to the causes.

The best proof we could ask for our philosophy lies in the fact that while they confess conjunctivitis often discomfits them with all their drugs and appliances we declare it is because they do not correct the hyperopia, which we always do, and have never failed to save the eyes and vision, except where they were either neglected so long, or were so maltreated by oculists that they were hopeless cases from the first. But we have also taken many that appeared hopeless, right from Chicago hospitals and oculists, and recorded their recovery in two weeks. A case in point is: F. H. Carstens, of Peotone, Ill., aged 14, came to me November 11, 1904, having been treated by Dr. Starkey, oculist, for catarrhal conjunctivitis for two years without relief. Intense congestion of conjunctiva, many phlyctenules, much photophobia, proving cyclitis and retinitis, pain in eyeballs,

proving tonic spasm. His father said Dr. Starkey always contended the boy did not need glasses. I gave him + 2.00 on general principles to stop accommodative possible effort until I could get him in shape for examination, instructed the father to see that he kept the eyes clean with warm water in the mornings, followed by cold salt water compresses about three times daily for twenty minutes, one of them being at bedtime, ordered him to snuff strong salt water up his nasal passages four or five times a day, sleep all he could and remain indoors until congestion disappeared. He reported on December 3d, just twelve days later, sound as a dollar and seeing 20/30 + with the + 2.00 which careful examination revealed to be the full correction for hyperopia, which Dr. Starkey, oculist, could not find, or at least did not find. I give names because if I did not the medical trust would say I am a liar. As it is they will say I am unethical. I am satisfied, if the trust is.

It is not only the sins of omission I condemn but those of commission as well. When they attempt to fit glasses it is without a comprehensive knowledge of either optics, ophthalmology, neurology or anything else that is absolutely essential. Here is one of Dr. Harper's cases, he who, once upon a time, conducted an optical college in Chicago:

Mrs. G., of Earlville, came to me on April 14, 1904, a long time sufferer from indigestion, dysmenorrhoea followed by menorrhagia, prolapsus uteri, treatment by local doctor, and eye trouble for which Dr. Bergeson, now of Boston, treated her a long time, then turned her over to Dr. H., who, she said, operated three times. She came to me wearing:

L. + .25 + .75 ax. 90 2 1/2 degree prism, base in.

R. + .25 + .75 ax. 90 3 degree prism, base in.

A hasty examination revealed an acute irritation of the nervous system, so I gave temporary lenses, + 1.75 and a dietary, directing her to return in three weeks. As her nerve supply measured, it indicated quick recuperative powers, I assured her she would have no further trouble and I would complete my work with one more visit. She had been menstruating every three weeks, and when I informed her she would go to the regular term she naturally doubted, but did not expose it until two days before the date fixed for her second visit when I received a letter saying she would prefer to wait a week as the date fell on her "sick-time." I replied no harm could come from waiting a week, which she did. Then she confessed that her menses delayed until the Saturday before her visit, but added that instead of going to bed, as usual, she took the train for Chicago. shopped all day, spent Sunday visiting parks, etc., with friends, and reported to me Monday, May 16. My final correction was:

L. + 1.00 + .50 ax. 90.

L. + 1.00 + .50 ax. 90.

She has been perfectly well of all her troubles ever since and knows, not only why she recovered, but how to keep well.

Analysis of the eye measurements shows the following:

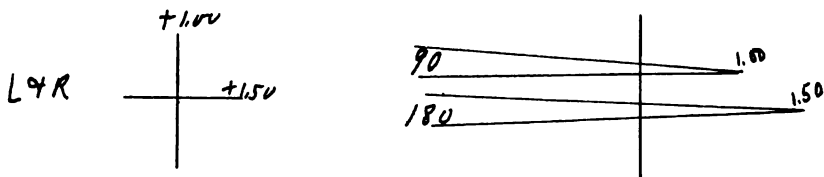


Fig. 58

with Dr. Harper's alleged correction the condition produced was:

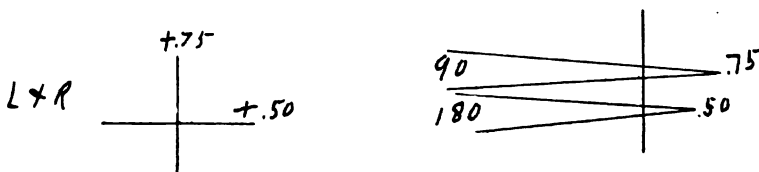


Fig. 59

requiring a nervous effort equal to the maximum amount of uncorrected hyperopia with its associated demands.

For Accommodation,

L. .75

R. .75 1.50

For Automatic Convergence,

L. $.37\frac{1}{2}$

R. $.37\frac{1}{2}$ 1.50

For Negative Pull,

L. $.37\frac{1}{2}$

R. $.37\frac{1}{2}$

Total, 3. D. per second.

to which must be added some increased negative pull for $5\frac{1}{2}^\circ$ prism base in which averages 8,640 D. daily for each degree, or 47,520 D. daily, which in turn had to be counterbalanced by a convergent pull through the internal recti, making another 47,520 D. or a total of 95,040 D. to be added to the 172,800 D. caused by the uncorrected hyperopia, making a grand total of 267,840 D. daily strain.. Her real error, as indicated by my prescription, caused 345,600 D. daily strain, or $34\frac{1}{2}$ per cent above the normal demand, but all his operations and glasses still left $26\frac{3}{4}$ per cent still draining, so it is easy to see why she did not get well.

This through her eyes alone; then her habits of diet were just the reverse of what they should be and with the quality and quantity regulated, her mind freed from worry by a clear understanding of what we were doing, why we were doing it, and how it was done, she could not have failed to make the recovery she did.

Incidentally this case is a good illustration of the operation of the neurometer in affording corroboration of our work. At the first examination she accepted only + 1.25 but as she showed 2° + impulse by the

static test I added $+ .50$ arbitrarily, making $+ 1.75$. The dynamic test before attempting to measure the error was 6.50 D., with $+ 1.75$ it was 9 ; this 9 D. indicates, by the neurometer, 23 years, 4 months; adding 6 years, 4 months, for her error, made a total of 29 years, 8 months; then I added 5 years for the intellectual development, making a grand total of 34 years, 8 months. I made no deduction for her history because of the presence of the $+$ symptoms which offset the $-$ ones. She said she was 35 exactly. Hence I knew I was right all the way through, and when I gave final correction I left $.25$ hyperopia uncorrected to give her splendid vision, because, while it causes 6 per cent excess demand on the nerve supply, she knows how to save it in other directions. Those who are disposed to apply my own criticisms to this must remember not only the reasons above, but also that I had not figured it against Dr. Harper; if I had I would have shown his treatment as saving exactly the same per cent ($7\frac{3}{4}\%$) of the real amount, just as it does as figured. More proof of the law of ratios.

ALLEGED DISEASES OF WOMEN.

A Criticism of Old Methods and Offer of a Better System of Treatment.

Nothing perpetrated in the name of medicine by the old schools is so reprehensible as their diagnosis and treatment of the disorders peculiar to the female sex. In efforts to keep their profession as mysterious as theological dogmas, doctors have strayed from the path of simplicity and directness so far it is doubtful if many ever return. They have magnified non-essential details until they are unable to differentiate between the important and the obscure. They have puffed themselves up so they have forgotten Nature's part. If a patient recovers under their treatment it was purely skill; if one dies, it is an act of providence. If an operation is performed, it is always successful; if the patient succumbs, it was the fault of the nurse. The unsexing of women has become so common that in the large cities it is done at least half a dozen times daily.

Statistics show that of castrated women, about 75 per cent subsequently suffered loss of memory; 60 per cent were troubled with flashes of heat and vertigo; 50 per cent confessed to a change in their character, having become more irritable, less patient, and some of them so changed as to give way to violent fits of temper; 42 per cent suffered from mental depression, and 10 per cent verged upon melancholia. In 75 per cent there was diminution of the sexual desire, and some had none; 13 per cent were not relieved of the pains from which they suffered; 35 per cent became abnormally fat. Some complained of deficient vision; 12 per cent noted a change in their voices to a masculine quality; 15 per cent suffered irregular attacks of skin affections; 25 per cent had severe headaches, and as many complained of nightmare; 10 per cent suffered from insomnia. In a few cases there was a sexual hyperexcitability not present before the operation. Gastric reflexes were

common, such as fermentation and its consequent effects, gastralgia, sour stomach, flatulency, etc.

Neurologists have taken a great many of these cases and have relieved them of much of their trouble; in quite a large number they were restored to comparative health, but, of course, it would be foolish to attempt to make perfect women of such cases, because Nature has been outraged; they are not all there. Our great hope is that we may get them before the crime has been committed, when we can not only render such aid to Nature that she will restore health, but we avoid the possibilities of anesthetics, operations and unnecessary suffering.

Fig. 60 shows the arrangement of the uterus, ovaries, etc., and the following brief explanation will be sufficient to understand: The vagina,

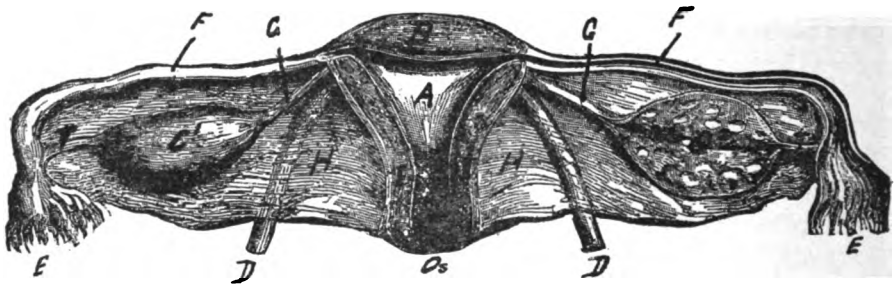


Fig. 60

not shown in the cut, is the cavity into which the uterus empties; it also protects the latter from exposure to atmospheric changes and traumatic injuries; its secretory glands, like the salivary glands of the mouth, lubricate its mouth and walls so that when the proper preliminary excitement has occurred between male and female the male organ enters easily without friction, hence no possible laceration. In cases of rape of children and even of mature females there is usually laceration of the lining membrane of the vagina because of its dryness and the force used. It is no proof of consent, however, to find no laceration, for, even under the pressure of fear, especially in married women, there would be automatic lubrication.

Referring to the figure: A is the body of the uterus, U the neck, B the fundus, and Os the mouth; C¹ and C² are the ovaries; T, T, are the tubes connecting the ovaries with F and F, the fallopian tubes; G and G, are the ligaments of the ovaries; D and D are the round ligaments which balance the uterus; H and H are the broad ligament which is formed by folds of peritoneum and encloses the uterus, ovaries, tubes, etc.; E and E are called the pavilions of the fallopian tubes, because they enclose the mouths of the tubes from the ovaries and receive the eggs when they start on their journey to the uterus.

All organs and tubes being of more or less muscular structure it follows that they have nerves, for without them muscles would be nothing but

ligaments, having power only in passive elasticity; these nerves are branches of the 3d and 4th sacral with supplementary power from the local plexuses.

C², in the figure, shows one ovary laid open showing the corpus lutea or yellow bodies, developed from the ovasacs or Graafian vesicles. When they have reached maturity their contents are expelled by the contractions of the ovaries, passed into the tubes and on to the uterus. These things are constantly maturing in some people, in others they are irregular and in none is there any certain time when they are not at work, therefore all stories about there being times when there is no liability of impregnation are false. It is true that just before menstruation in some, just after in others, and both immediately before and after in others, there is greater activity, and more of the vesicles develop, so there would naturally be more liability at those times.

Now, here is where my old foggy friend, the old school doctor is going to sneer and ridicule, but I anticipate him with a proposition: I have proved what I am about to say, so abundantly that I will take any case of the class described, that has not been operated, and fix it so Nature will effect a cure in ninety days or less or I will forfeit a thousand dollars to the doctor who brings the case.

In hypermetropia, where the demands upon the nervous system, for accommodation, are excessive, the extraordinary current thus made necessary is distributed, as described in the chapter preceding, to the points of least resistance. The os uterus being one of them which is most susceptible because of its intermittent periodic activity, suffers stricture. The natural effects are: first, amenorrhoea, because in the immature female, when the function of menstruation has not yet begun it is arrested in its attempts and if auto-intoxication does not follow in acute form there will, at least, be interference with the growth of the child and in many cases there is general debility, followed by atrophy which is known as tuberculosis, hasty consumption, etc.; second, dysmenorrhoea in those in whom the function obtains, and for which the old schools prescribe the curette and hysterectomy, or in a lewd manner suggest marriage; third, dysmenorrhoea plus menorrhagia and shortening of the period between the menses which, of course, produce anaemia, neurasthenia and often melancholy; fourth, the peristaltic action of the fallopian tubes becomes involved and cramp of the ovaries follows, producing pains, sometimes dull, sometimes sharp; fifth, the vesicles mature and the ova, being retained, decay, forming cysts or tumors; sixth, the hospital, the anesthetic, the surgeon, castration and possibly death from shock or sepsis, or, escaping these, an unhappy life, because all good women's supreme happiness is found in motherhood.

Of the associated ills the versions and flexions, prolapsus, metritis, leucorrhoea and bladder troubles are the most common.

When the nerve strain, from whatever cause or combination of causes, has continued until the limit of endurance is reached, the natural result is collapse; the muscles of the "broad ligament" relax from enervation and down comes the womb; as it falls it must either protrude from the mouth of the vagina, tilt obliquely across that canal, usually forward or backward on account of the round ligaments, or double on itself. In any of these false positions there is pressure on the bladder or rectum, or both, causing constipation, a frequent desire to urinate, bearing down sensations, accompanied by hot and cold flashes from the pressure upon the heat nerves; the internal effects on the uterus are bad, either hypertrophy or atrophy. These all combine to make the patient uncomfortable, interfere with the machinery generally, and make mental and physical wrecks. They have an able ally in the patent medicine advertisements and even in the old-school doctors who would not depart from their beaten paths for anything short of a general catastrophe, the which I hope to create with this work.

Frequent urination is not always a symptom of pressure on the outside of the bladder. It is often the product of stricture of the muscular ring around the neck of the bladder, which I have named elsewhere a "pseudo prostate," and exhibits in the spasm stage which precedes enervation, only yielding enough to reduce the contents, not sufficiently to empty the bladder. I have had many cases of it in which relief was permanent after wearing the correction for hyperopia, and it came in less than a week. Of course the dietary, rest, etc., were strong factors in the matter of permanency.

Leucorrhoea is often due to the general weakened conditions from the other derangements, but is also found in women who eat too much plus food, and in those who, having been taught that the vagina must never be washed except with physicians' prescriptions, at so much per, are simply unclean. Imagine one neglecting to wash the mouth daily. After each menstrual period the vagina should be washed thoroughly with hot soap-suds, followed by a rinsing with tepid water containing about one to two tablespoons of common salt to two quarts of water. A fountain syringe and corrugated nozzle should be used, and the salt dissolved before putting it in the fountain; the latter should be used once daily. The mother who fails to inform her daughter of the nature of her organs and their proper care is a criminal, or an idiot. The worst case of leucorrhoea will yield to such treatment in a week, provided it is supplemental to the correction of errors of refraction, diet, habits, etc., as detailed in other chapters.

It is rarely that it is necessary for the doctor to give manual treatments to his patients. As a rule if they follow instructions as to rest, etc., Nature does the curing in short order, but for the acute pains of dysmenorrhoea, if the patient is laid on her back in a comfortable position, while the doctor applies pressure to the sacrum with one hand while he titilates the clitoris

gently with the other for about twenty minutes or even longer, he will find his patient growing more and more comfortable and finally dropping off in sleep. The chronic objector will say, "Why that is merely creating sexual excitement." I answer, "Certainly, that is one of the most natural conclusions in the world." The rhythmic action of the nervous waves is thus restored, the positive action is followed by the negative reaction and the crisis of convulsions is averted. It is one of the essentials of a good physician to be able to utilize Nature's own methods to set her machinery right when it becomes deranged. Other objections only occur to lewd minds. The treatment is never needed after the first month, and often only at the time of menstruation which occurs so soon after the patient is received that the general system has not had time to relax from action of our methods.

The menorrhagia following dysmenorrhoea; or from weakness, even to post-partum hemorrhage, may be arrested instantly by taking a good hold of the hair around the os and giving a quick jerk. This, I believe, is an osteopathic trick, is painful, but only for a moment, and is effective in establishing inhibition. It is reasonable and is worthy of recognition as is also the matter of luxations of the vertebrae. Of the latter I have had one remarkable case: A young woman, aged 22, school teacher, cross-eyed (divergent squint), anaemic, neurasthenic, prolapsed uterus, and all the accessories. Incidentally she told me she never could wear a corset, saying it smothered her. I found one of the lower dorsal (or upper lumbar, I never could tell which, because I fixed it so quickly I forgot to get its name), vertebra decidedly out of place, and without a word I put my left arm around her and pulled her backward, as she stood, over my right thumb. when, snap! it went into place. She gave a little shriek, but that was all. In two days she reported the soreness all gone and in three months came to say she was a well woman, wore a corset, like other folks, and had gained nineteen pounds. Of course her eye correction, her dietary and the rest she took contributed in accomplishing what the fixing of the back never could have done alone, but I want to recognize it as a contributing cause and treatment. At the same time I have no hesitancy in comparing osteopathy, chiropractic and similar "schools" with the prohibition political party—their single objectives will not do.

Neurology is neither a "pathy," an "ism," nor an "ic." It is a rational procedure from start to finish. It opposes the use of drugs and operations, where they can be dispensed with, and simply seeks to broaden that field. It recognizes the surgeon as one of the necessary evils of this world and the drug doctor as a complacent receptacle (metaphorically, of course) for the few cases that are beyond the limit angle of analysis where one man's guess is as good as another.

THE FITTING OF GLASSES.

Cycloplegics Are a Humbug Suitable Only to the Oculists Who Use Them.

The emphatic assertions of some writers with reference to the value of cycloplegics are unwarranted by the facts. I assert as emphatically the drugs are not only worthless, but inconvenient and dangerous. I will tender a few reasons for my claims.

The chief reason is that not one in a thousand users know how to use it, as is proved by their utter ignorance of how to tell when the accommodation is paralyzed; and if it is incomplete their method of applying lenses could not possible do more than approximate the spherical part of the correction and very rarely even do that much with the astigmatism, hence their assertion that "astigmatism is an elusive imp of mischief and it requires great keenness and patience to hunt him down. His hiding place is the ciliary muscle and his disguise amblyopia. He hates atropia as his father was said to hate holy water." Let one of the partisans of atropine instill the drug until he is satisfied the accommodation is at rest, then, if he can, let him fit his patient. When that is done, add $+ 3.00$ for the 13-inch point. If the atropine is in absolute control there will be no difficulty in reading ordinary print, of course. Then let him direct the patient to hold the print as close to his face as he can read, measure the distance in inches, convert it into diopters and whatever it amounts to over 3.00 is the unsuppressed accommodation. If any demands greater proof than that he must apply to me personally.

Another reason is that anyone who really knows how to fit glasses can do it as well, or better, without a cycloplegic than with it, as will be shown in this chapter.

Another is that when the drug is used it partly disables one of our greatest allies in proving our work.

Another is that it causes great inconvenience to the patient, at least temporarily, and often permanently if repeated too often—a common fault among users, who thus prove they are not sure of their work from the results of one test, else repeating it is dishonesty toward the patient.

Another is that after the work is done under atropine they dare not prescribe the full correction found because the patient cannot see well; hence their rule: "Under the age of twenty give one-fourth full correction; over twenty and under thirty, give one-half, and over thirty, give three-fourths of the full amount.

Another is that we want to show our patients exactly the conditions we are going to put them in at first, and why, then we have no difficulty, except when some wiseacres interferes, and we caution patients against all such.

Oculists merely treat eyes (most of them maltreat), while neurologists use the eyes to measure the condition of the nervous system and must, of

course, be able to measure their defects exactly without creating any unnatural conditions. For our convenience and to facilitate explanations, we classify the several cases we meet into the following:

- First—Those with good vision.
- Second—Those with medium vision.
- Third—Those with bad vision.
- Fourth—Cross-eyes.
- Fifth—Those with spasm of accommodation.
- Sixth—Those with asthenopia.
- Seventh—Children and illiterates.
- Eighth—Old people.

Fig. 61 shows the proportions of the letters in the Snellen Test Chart. The patient being seated at 10, 15, 20, 30, 40, 50, 60, 80, 120, 160 or 200 feet from it should read the type corresponding to that distance, as marked on the card. The usual working distances are 15 and 20 feet. Visual

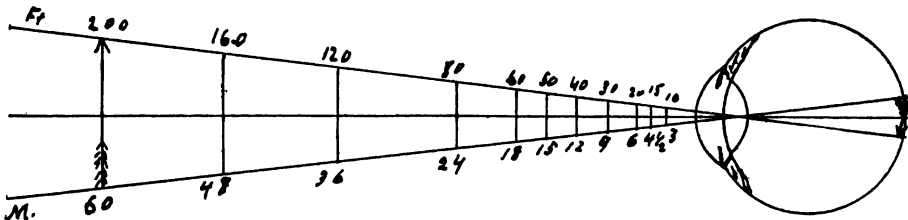


Fig. 61

acuteness is expressed in fractions, the numerator being the distance and the denominator the number of the type patient reads; thus, if seated at 20 feet and number 30 type is the smallest that can be read without error, vision would be recorded 20/30; if number 20 is read it would be 20/20 which equals normal; if number 15 is read it would be recorded 20/15. Sometimes it is necessary to have the card only a few feet away; one eye may have 20/20 vision and the other only 2/200, that is, can only read the largest type at 2 feet. For very small rooms the 15 or 20 feet distance may be obtained by using a mirror and a card printed backwards so it will appear correctly in the mirror. In fitting eyes we look for:

First, + spheres.

Second, — cylinders.

Third, — spheres.

The only possible results are:

First, + spheres = simple hyperopia.

Second, + spheres, — cylinders = simple hyperopic astigmatism, or compound hyperopic astigmatism, or mixed astigmatism.

Third, — cylinders = simple myopic astigmatism.

Fourth, — cylinders, — spheres = compound myopic astigmatism.

Fifth, — spheres = simple myopia.

The second are the only ones that ever need correction by transposition. If the cylinder is weaker than the sphere it is really a case of compound hyperopic astigmatism and the prescription will transpose to a + sphere and + cylinder. If the cylinder is of the same power as the sphere it is a case of simple hyperopic astigmatism and the formula will transpose to a simple cylinder. If the ~~sphere~~^{cylinder} is the stronger, ever so little, it is a case of mixed astigmatism, but unless it is at least twice as strong as the sphere it needs transposing to get it into its simplest form.

A short way to transpose a prescription that needs it is: Take the difference between sphere and cylinder for the new sphere, then use the power of old cylinder, changing sign and axis. Thus the three possible cases above would be:

Original.	Transposition.
+ 1.50 — .50 ax. 180	= + 1.00 + .50 ax. 90.
+ 1.50 — 1.50 ax. 45	= + 1.50 ax. 135.
+ 1.50 — 2.50 ax. 30	= — 1.00 + 2.50 ax. 120.

We proceed, subjectively (tests with retinoscopes, refractometers, ophthalmoscopes, ophthalmometers, stigmatometers, etc., are merest guess-work), as follows:

First, Get the visual acuteness of each eye, separately, and record it. If it is normal it proves there is no myopia; if it is a line better than normal it proves there is hyperopia of at least 1.00 D. and that there is no astigmatism worth looking for; if it is not as good as normal it may be hyperopia with insufficient accommodation, or it may be astigmatism, or it may be myopia, or it may be the optic nerve is affected.

Second, Get the maximum power of accommodation and record it. If the patient's age is known and this is excessive it indicates hyperopia, unless there are no evidences of nerve strain, when it may mean myopia, if vision was bad according to the first test.

Third, Test the muscle balance, which is really a static nerve test, with the double prism on one eye, adjusted so a light at fifteen or twenty feet appears as two, one above the other, and with a colored glass on the fellow eye. The colored light should be in line with and midway between the white ones. If it is the nerve distribution is either normal or there is spasm in both the 6th nerves and internal recti branches of the 3d. In either case it is orthophoria. If the lights are not in line it is heterophoria. If the colored light deviates toward the nose it is esophoria and means nervous spasm, exhibited in the internal recti, and it will also be found in the accommodation when we try the refraction tests. If it deviates from the nose it is exophoria and signifies weakness of the nerve supply, exhibited in the interni and of course it will be found in the accommodation during the refraction test, unless it be a clonic spasm, which will make its presence known very quickly. If the deviation is up or down in connection with

either of the above, it is hyperesophoria or hyperexophoria and means the disturbance is more general. If it simply deviates up or down, it is hyperphoria, and means an erratic distribution of nerve force.

Fourth, Put in front cell of trial frame + spheres, just strong enough to blur vision until the largest type on the test card is seen dimly, then put the next weaker in the rear cell, remove the first ones and repeat the operation, using the next weaker at each change (unless the patient shows signs of spasm by not improving in vision with each change, when it is proper to cheat the accommodation by leaving the same lenses in while pretending to change), until vision is good enough so patient can pick out a few letters on the line he read easily without lenses. Stop at this point and cover each eye, alternately, to see if vision is practically equal. If it is not, put more + on the good eye, then continue as before until the same point is reached.

	2	1	C	R
Static $\frac{2.0}{4.0}$				
Fog to $\frac{2.0}{2.0}$	③			
Unfog to $\frac{2.0}{4.0}$	①			
+ Sphere $\frac{2.0}{4.0}$	④			
Slot at 180 $\frac{2.0}{2.0}$	①		180	
Slot at 90 $\frac{2.0}{5.0}$	①		90	
Slot at 90 $\frac{2.0}{2.0}$	①		90	
Sph + 2 Cyl - 1. ax 180	①		90 180	
Static $\frac{2.0}{4.0}$				
Fog to $\frac{2.0}{2.0}$	③			
Unfog to $\frac{2.0}{4.0}$	①			
Slot at 180 $\frac{2.0}{2.0}$	①		180	
Slot at 90 $\frac{2.0}{5.0}$	①		90	
Slot at 90 $\frac{2.0}{2.0}$	①		90	
Sph + 1. Cyl - 1. ax 180	①		90 180	

Fig. 62—Concluded on next page.

Fig. 62 is intended to illustrate that part of the fogging system which relates to measuring errors of refraction without cycloplegics. The space between the lines C and R is the eye; the line C the cornea; the line R the retina; the space 1 is the rear cell of trial frame; the space 2 is the front cell; convex figures are + spheres; concave figures are — spheres and cylinders; — lenses in front of space 2 are held in the operators' hands. If more than + 3. is needed to fog, use it, of course. C H stands for compound hyperopia; S H A, for simple hyperopic astigmatism; Mx. A, for mixed astigmatism; C M A, for compound myopic astigmatism. Simple myopic astigmatism would be found by locating the good meridian with the slot, then reverse

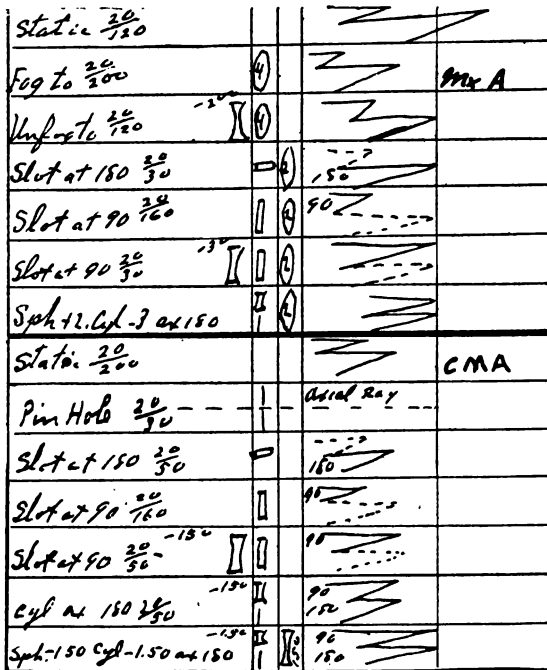


Fig. 62—(See preceding page.)

In the diagram the dotted lines indicate the meridian shut off by the slotted disk. In space devoted to C H vision with sphere should not be quite as good as with naked eye. This is left out of S H A and M A for want of space, and it is not needed in C M A.

Fifth, Direct attention to the astigmatic chart, Fig. 63 is usually the best, and require the patient to tell which line if any is plainest. If there

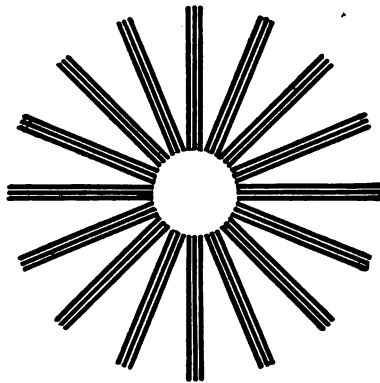


Fig. 63

is one, it indicates astigmatism and that the meridian at right angles to the plainest line is the one corrected by the sphere. To prove this, put the slot on that meridian and have him read the smallest letters possible, then reverse the slot and vision should be worse. If it is hold weak —

it and hold — spheres in front until vision is almost as good as in the other meridian; get cylinder indicated and prove. Simple myopia is fitted by first giving — sphere strong enough to give 20/80 vision then try slot and finding all meridians equal in visual acuteness, remove slot and increase the spheres. Simple hyperopia is found by fogging and unfogging to 20/30, then try the slot and when no astigmatism is found, treat the other eye in the same manner; then try both together and if vision is not 20/20 it can be made good by reducing the spheres.

spheres in front of the slot, increasing the power gradually until vision is almost as good as in the other meridian; then substitute a cylinder of the power indicated, for the slot, placing the axis on the meridian where the slot showed best vision through the sphere. To test the correctness of the cylinder, first direct attention to the astigmatic chart and let the patient tell whether the lines are all equally distinct. If the ones which were plainest before are still most distinct the cylinder is not strong enough; if the opposite ones are plainest, it is too strong. If he says they all appear alike, reverse the axis and if that spoils the equality of vision on the chart put its axis back where it was, refer him to the letters again and take a $+ .25$ cylinder in one hand and a $- .25$ cylinder in the other, then try them alternately, the $+$ first, axis on axis; if vision is just as good with the $+$, the $-$ cylinder in the frame may be reduced; if it is not as good, try the $-$ cylinder, and if it improves vision compare it with a $- .25$ sphere, when, if the sphere gives best vision, the original cylinder is proved. In the latter instance do not reduce the sphere, as appears to be indicated by the improvement in vision, but wait until the other eye is finished, when the accommodation may relax a little more, making reduction of the sphere unnecessary. There are cases in which the cylinder, being $- .75$ or less, may be stolen without impairing vision on the letters, although the astigmatic chart will not be perfect. The manner in which this is accomplished is to remove the cylinder from the trial frame, holding it in one hand and alternating it with a $- .25$ sphere in front of the eye, and if vision is best with the sphere of course the cylinder should be discarded; or, if a $- .50$ sphere gives better vision than a $- .50$ or $- .75$ cylinder, we often discard the cylinder. Fig 64 shows the principle: Let the plane

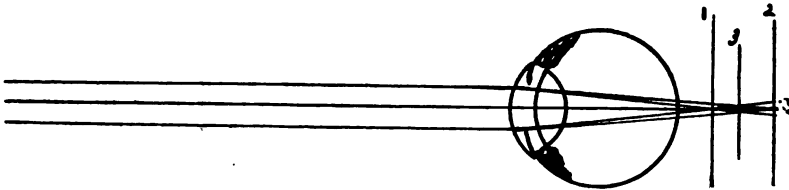


Fig. 64

1 show the focus of the vertical meridian and the plane 2, that of the horizontal meridian; the plane 3 shows where the circles of diffusion would form a round spot, but not a perfect focus. Suppose the hyperopia in the vertical meridian is 1.00 D. and in the horizontal is 1.50 D., $+ 1.25$ sphere would put the plane 3 at the retina, the vertical meridian would be a little over-corrected and the horizontal a little under-corrected, but the saving of nerve strain would be five-sixths of the total, and vision would be as good as with the naked eye. Such corrections are evidences of skill and judgment on the part of the operator.

If, in beginning the test for astigmatism, the patient sees no difference

in the chart Fig. 63, it is not proof there is no astigmatism and the slot is used to find the meridian of best vision, when it is reversed and the proceeding continued as described above.

If, in proving cylinder reversing the axis spoils astigmatic chart but makes letters clearer, there is not enough + sphere. Increase before proceeding.

Sixth. After testing the other eye for astigmatism, both eyes are used to prove the spherical corrections. Cover the eyes alternately and proceed as per the last sentence in first paragraph of rule four.

Seventh. Get the maximum accommodation with correction on. If the patient is under twenty years of age and in good condition, it will not be any greater than at the first test, and probably less, because the glasses interfere with the limit-angle of convergence; if it is increased, it means the patient needs rest. Between twenty and thirty-five years the increase should approximate the power of the + spheres; if it is not so much, it means a good condition; if it is more, it indicates weakness. If the age is over about thirty-five but the patient is not yet presbyopic, the increase should be equal to twice the strength of spheres; if it is not, it means general weakness until after forty-five years, when it usually means presbyopia. If any patient has not been wearing constantly a correction of his errors of refraction and appears to need additional spherical power for close work under forty-five, do not give it, but require the correction worn constantly and rest from all work for a week or two when he will be able to do his close work without addition.

Eighth. To find the proper amount to add for close work, have patient hold a newspaper at the farthest point he expects to work, measure the distance in inches, take its equivalent in diopters, + spheres, and offer them, holding in front of both eyes at once, (be sure to hold them in good position over the other lenses); if he cannot read with them reduce them .25 at a time until he can read dimly at the original point, then tell him to draw the paper to the usual position, when he will declare it perfect. This saves changing the reading glasses so often and insures best results from the lenses. If, as will be found occasionally, in cases where the hyperopia is so great that vision is poor even with best correction obtainable by the distance test, the patient requires an addition for reading of greater amount than the working distance represents, increase the lenses for constant wear the amount of that difference. For example, a patient accepts + 6.00 for distance, but for reading at 13 inches + 4.00 must be added; it follows that as only + 3.00 is required by law the other + 1.00 must be added to the lenses for constant wear; they will be accepted readily, too.

Ninth. Test the muscle balance as before; the cylinders may be removed for this purpose because they are always —, but the spheres must remain. If the frame has three cells it is not necessary to remove the cylin-

ders. If there was esophoria before and it remains to the extent of 1° to 3° , we know there is still .50 hyperopia concealed by a tonic spasm; if there is 4° to 6° , .75 hyperopia is concealed; if it is 7° to 10° , there is 1.00; if it is 11 to 13° , there is 1.50 and if it is 14° or more there is 2.00 D. concealed, and we add these respective amounts to the correction accepted, regardless of vision, because constant wear will cause natural relaxation, and when the spasm is broken we retest and make whatever changes may be found necessary to be exact. In many cases we are able to prove the correction at once by the use of the neurometer. For example, a patient accepted + 2.00 with 20/20 vision, showed an accommodation of 9.00 D., indicating 23 years, 4 months, by the neurometer, he showed esophoria of 2° by this test, so + .50 was added arbitrarily. Reference to the neurometer table of additions to age for hyperopia indicated 4 years, making 27 years, 4 months; then for his professional work, which develops the intellectual brain and makes the nervous system more responsive to demands, there was added 7 years, 6 months, making a grand total of 34 years, 10 months. He said he was 35 years, 3 months and 5 days. By changing our correction to + 1.75 he saw 20/20 well, and adding the + .50 for esophoria, made + 2.25, for which the table says add 4 years, 5 months, 10 days to the showing by accommodation and profession. Thus 23 years, 4 months, plus 7 years, 6 months, plus 4 years, 5 months, 10 days, equals 35 years, 3 months, 10 days, and we decide to prescribe + 2.25 instead of + 2.50, which proved correct by later tests after his nervous irritation subsided.

Tenth. Nearly all cases should wear spectacles, at least until the nervous system recovers its normal status; it is essential for appearance as well as comfort that the measurements be taken properly and the prescription filled as written. A common fault among manufacturing opticians is they do not exhibit ordinary intelligence, or honesty, in their work; they take a pair of pliers and bend a nose-piece until it corresponds to the measures given, with the result that the patient looks like a caricature when he puts it on. They call this "prescription" work, which is a mistake.

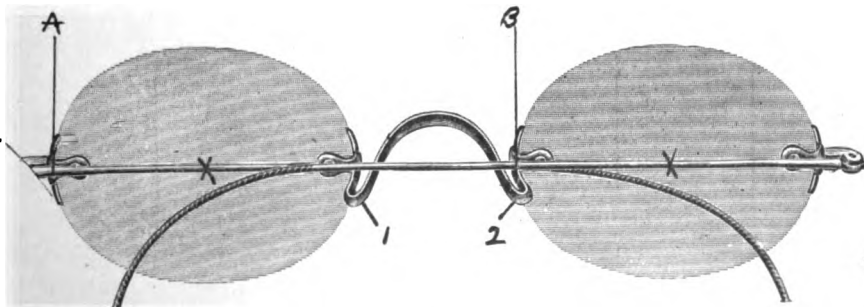


Fig. 65

Fig. 65 shows what is called a "saddle" bridge, or nose-piece, by opticians. The shanks extending from 1 and 2 to the lenses are for the

purpose of changing the pupillary distances with a simple twist of the wrist; it is a convenient thing for the mechanic, and is not always hideous in its results because some noses require little or no change and it does fairly well, but there are a great many cases where the bend for the shank should be just where the temples cross the bridge in Fig. 65, and the spectacles shown in the cut would look neater on any face. They should be made "saddle," but more like the old-fashioned "C" bridge. Hoping that this may come to the notice of opticians, I suggest they adopt the idea when a prescription comes with the injunction "make this bridge of as little material as possible." The intent of the saddle is to permit the operator to adjust a trifle if necessary. The optician should make frames to the measures, not bend to them.

The following measurements are all that are necessary: Distance between pupils, X to X, in Fig. 65, (to find it exactly in a pair of glasses, measure from A to B, in the cut), height of bridge from where temples cross, as shown in cut, to inside of top; width bridge at base, 1 to 2 in the cut; position of crest or top of bridge with reference to a plane corresponding to the side of the lenses nearest the face; sometimes it is on the plane, sometimes back of it, and sometimes in front, the latter most rarely, the object being to regulate the distance of the glasses from the eyelashes. The angle of the crest of the nose will take care of itself if the optician follows my suggestion with reference to the shanks; it is a law of nature, (as absolute as is the law of nonspherical curvatures, that the two principal meridians are always at right angles to each other). The temple distance is not measured, but is regulated by the size of the lenses. A very small face would require 1-eye lenses, while a very broad one would need 0000-eye. The length of the hook temples should be given, and make them so long that the ends are just concealed by the lower part of the ears as the observer stands in front. Great discomfort results from making them too short.

Have a set of frames as follows for convenience in fitting:

NOSE.					
Size of Eye.	P. D.	High.	Wide.	Crest.	Temples.
I	2 $\frac{1}{8}$	1-16	$\frac{1}{2}$	1-16 Back	Short
o	2 $\frac{1}{4}$	$\frac{1}{8}$	9-16	On plane	Med.
o	2 5-16	3-16	$\frac{3}{4}$	On plane	Long
o	2 $\frac{3}{8}$	$\frac{1}{8}$	$\frac{5}{8}$	On plane	Long
o	2 $\frac{3}{8}$	$\frac{1}{8}$	$\frac{5}{8}$	$\frac{1}{8}$ Back	Long
oo	2 $\frac{1}{2}$	1-16	$\frac{7}{8}$	$\frac{1}{8}$ Back	Long

If skeleton lenses are wanted, order a size larger than the fitting frame.

Never order skeletons for children.

If eye glasses are wanted, they should be of the same size as the fitting frame.

The foregoing applies to the first and second classes enumerated at the beginning of this chapter, except that for the second class it is usually best to take each eye separately all the way, except in the final proving of the spheres. In doing this unfog with — spheres .25 and .50; then .50 and .75; then .75 and 1.00, etc.

The third class is seldom difficult if there is any vision at twenty feet. If there is not, move patient closer until two or three lines of the test type are visible, then try the pin-hole disk and if it improves vision there is just that much encouragement. Next try the slot, whether the pin-hole improves or not. If one meridian is better than the other, leave the slot there and put such strong + spheres in the rear cell that they make vision worse, then neutralize gradually with — .25, — .50, etc., until the vision is as good as it was through the slot without the lens. Put in the + spheres indicated, if any has been accepted, then reverse the slot and vision should be worse. First offer + spheres in front of the slot and if they are accepted, with improvement of vision, continue increasing until the best possible vision is obtained, then give enough more to blur to the top line and neutralize away as before. If + spheres are not accepted, try —, and when that meridian sees as good as the other, stop and put on the cylinder indicated, prove it and proceed to get vision as good as possible by weakening the + sphere if necessary. In other words, find the best meridian if there be one, which locates the two principal meridians. Use the slot to isolate all but one at a time and treat it as simple hyperopia or myopia. Then put the results on a cross, diagram them and write the prescription, put it on the patient and prove it.

The fourth class is so important in many respects that a chapter has been devoted to it, which see.

The fifth and sixth classes need temporary sphericals. The fifth should be fogged to 20/80 as a rule, until the spasm breaks down, while the method described in connection with Fig. 63 is best for the sixth.

The seventh class, children, can often read the letters and is comparatively easy, except that nearly all have a clonic spasm of accommodation and must be handled carefully. Illiterates are comparatively easily handled by using the clock-face chart, fogging at twenty feet until the chart blurs, then unfogging until it is clear. If there is astigmatism so that patient sees one line plainest, fog and unfog until the opposite line appears plainest, then put in the + sphere indicated and finish with — cylinders, axis opposite the black lines. Unless there is much astigmatism do not correct it. If addition for reading is necessary, let patient be the judge of what is best.

For the eighth class permit 20/20 vision with distance glasses, and add all the spheres they will accept for the near work. Remember in adding for reading the cylinder is not changed. Increasing the sphere gives what the eye needs.

THE NEUROMETER.

Method by Which We Prove the Accuracy of Our Analyses.

One of the best ways to study a subject is to fix an ideal, then compare the real with it and keep statistics. This is the method I practiced in constructing the Neurometer (nerve measure). Prof. Donders printed, many years ago, the following table of accommodation, to show how it weakens from youth to old age and used it as a basis of calculation for the power of glasses for presbyopia.

10 years,	14.00 D.
20 years,	10.00 D.
30 years,	7.00 D.
40 years,	4.50 D.
50 years,	2.50 D.
60 years,	1.00 D.

He claimed that after 40 years, when the person with 4.50 D. accommodation, or less, used 3.00 D. for reading at 13 inches it took so nearly all that the eyes soon tired. Of course, it was the nerve supply in the cerebellum that gave out, but it exhibited in the eyes, so he was partly right; but he was mistaken in another important particular: he often prescribed more than + 3.00 for work at 13 inches and because the patient could see distant objects perfectly without glasses he assumed there was emmetropia, hence his table of numbers for glasses to be used at different ages in presbyopia is wrong, for any eye that is emmetropic will focus parallel rays at the retina without accommodation, hence would never need more than + 3.00 for 13 inches. Or, an ametrope, with exact correction, will never need more than + 3.00 added for work at 13 inches. He will not need all of that when he begins to require addition for reading, as he will be able to do some of the work for a long time.

However, the professor's table gave me an idea for which I am duly thankful, and I elaborated it into an ideal standard for ideal persons with ideal eyes. It is assumed that the ideal day's near work amounts to three hours' actual application at about 13 inches. On applying this standard to several hundred cases I found many persons work more than three hours at close work, and such were invariably older than the table indicated for their accommodation, so I made allowances for the extra development from the extra work as will be seen. Then I found that hyperopes, whose accommodation is constantly at work during waking hours, also showed overdeveloped power in the eye department, even when they exhibited weakness in other parts of the body. This necessitated more allowances, not only for the hyperopia, but for extra hours' work at near points and for the effects of the extraordinary demands upon the nerve supply as found by examinations and tests, all of which follow and have been proved abundantly by myself and my pupils, who understand my methods of taking measurements.

For the dynamic test we use the ordinary type in vogue with the daily newspapers of our time, have the patient read aloud, holding the paper as near as possible to read a line by straining. We measure the distance from paper to the principal plane of the eye, which is at the apex of the cornea and express the amount in dioptries.

For the static test we use a double prism before one eye and a red glass before the other; it makes no difference which eye the red glass is on, but I put it before the eye nearest to me. The three lights should be in a vertical line, the red, of course, in the middle. If the red deviates toward the patient's nose it indicates a + impulse, that is, an irritation of the nervous system to such an extent that it is in a state of tonic spasm throughout the body. We know by this there is not only hyperopia but that the spasm of accommodation is so great we will have a fight to control it, and, after we have made the refraction test and got on all the + we can, if the static test repeated shows the + impulse remaining we have proof we did not get all the hyperopia—the neurometer tells how much is lacking. If the red light deviates from the nose it indicates a — impulse, or exhaustion of the nerve supply to such an extent that as soon as the eyes are thrown out of gear (which is practically what the test does), it exposes the truth even if the dynamic test deceived us. We know, then, that there will not be a great deal of resistance during the refraction test, although we are equally as vigilant as when dealing with a state of irritation; and if the static test, applied after correction shows some deviation or none, the neurometer tells what it means and what to do. If the red light deviates toward or from the nose and above or below the mid-line between the white lights, it indicates an erratic nerve distribution as well as the + or — impulse; or, if the red deviates up or down, but neither to right or left, it indicates an erratic state of the nerves, either clonic or tonic spasm. The static test is of no use on one-eyed or cross-eyed people.

Four points are worthy of especial mention in this connection: First, our + impulse is esophoria, that is the eyes tend inward from spasm of the nerve supply, exhibited through the internal recti muscles of both eyes. My opponents, who claim the eyes deviate opposite to the direction the lights are seen, call it exophoria, meaning eyes turning outward. Second, our — impulse is exophoria, eyes tending outward from weakness of the nerve supply exhibited through the internal rectus muscles. My opponents call this esophoria by the same token they call the other exophoria. They also declare the eyes turn in from weakness of the external recti muscles and turn out from weakness of the interni. They say I am inconsistent. I retort they are chumps. Third, they say muscles are at fault when there is deviation with the test on, even if the patient controls the two eyes and holds them in perfect balance with the test off, which is nearly always the case. I say it is the nerve supply away back in the

cerebellum, which is at fault. They operate and if the nerve supply is sufficient to overcome the damage, they claim a victory for operation; if the nerve supply is insufficient to act properly, in spite of the operation, they admit no blame, but the victim has troubles galore. I never operate and always have good results. Fourth, the amount of prism required to set the red light in the middle is not the measure of the degrees of deviation, but is an indication of the intensity of the spasm if prism required is base in, or of the extent of the exhaustion if it is base out. The prisms are merely artificial substitutes for the natural impulse which is supplied under the direction of the controlling center in the brain, when the test is off. I would give a patient half a dozen grains of strychnine as quickly as I would a prism for constant wear. See chapter on prisms.

THE NEUROMETER.

Near Point.		Diopters.	Years.	Age. Months.	Days.
2¾	in.....	14.00.....	10.....	0.....	0..
3	".....	13.00.....	12.....	6.....	0..
3¼	".....	12.00.....	15.....	0.....	0..
3½	".....	11.00.....	17.....	6.....	0..
4	".....	10.00.....	20.....	0.....	0..
4½	".....	9.00.....	23.....	4.....	0..
4¾	".....	8.50.....	25.....	0.....	0..
5	".....	8.00.....	26.....	8.....	0..
5¼	".....	7.50.....	28.....	5.....	0..
5½	".....	7.00.....	30.....	0.....	0..
5¾	".....	6.75.....	31.....	0.....	0..
6	".....	6.50.....	32.....	0.....	0..
6¼	".....	6.25.....	33.....	0.....	0..
6½	".....	6.00.....	34.....	0.....	0..
6¾	".....	5.75.....	35.....	0.....	0..
7	".....	5.50.....	36.....	0.....	0..
7½	".....	5.25.....	37.....	0.....	0..
8	".....	5.00.....	28.....	0.....	0..
8½	".....	4.75.....	39.....	0.....	0..
9	".....	4.50.....	40.....	0.....	0..
9½	".....	4.25.....	41.....	3.....	0..
10	".....	4.00.....	42.....	6.....	0..
10½	".....	3.75.....	43.....	9.....	0..
11	".....	3.50.....	45.....	0.....	0..
12	".....	3.25.....	46.....	3.....	0..
13	".....	3.00.....	47.....	6.....	0..
14	".....	2.75.....	48.....	0.....	0..
15	".....	2.63.....	49.....	4.....	15..
16	".....	2.50.....	50.....	0.....	0..
18	".....	2.25.....	51.....	8.....	0..
20	".....	2.00.....	53.....	4.....	0..
22	".....	1.75.....	55.....	0.....	0..
26	".....	1.50.....	56.....	8.....	0..
32	".....	1.25.....	58.....	4.....	0..
40	".....	1.00.....	60.....	0.....	0..

If our patient is an emmetrope but works extra hours over the average three upon which this table is based, we would add to his showing by the dynamic test:

For 6 hours extra, 10 years, 0 months.

For 5 hours extra, 8 years, 4 months.

For 4 hours extra, 6 years, 8 months.

For 3 hours extra, 5 years, 0 months.

For 2 hours extra, 3 years, 4 months.

For 1 hour extra, 1 year, 8 months.

If the patient is a hyperope and is working extra hours, too, it is evidently just that much worse for him, so we figure the extra hours equal to more error, thus:

6 hours extra, equals 1.00 D. more hyperopia.

5 hours extra equals .75 D. more hyperopia.

4 hours extra equals .75 D. more hyperopia.

3 hours extra equals .50 D. more hyperopia.

2 hours extra equals .50 D. more hyperopia.

1 hour extra equals .25 D. more hyperopia.

For intelligent people who apply themselves diligently, thinking and reading, we add from 5 to 10 years for the mentality and its effect on the accommodation.

All calculations where errors of refraction exist must include the following table with variations, unless especially exempted:

ADDITIONS FOR HYPEROPIA.

		Years.	Months.	Days.
For 1.00 D.	add	10.....	0.....	0
For .75 or 1.25	"	8.....	9.....	0
For .50 or 1.50	"	7.....	6.....	0
For 1.75	"	6.....	3.....	0
For 2.00	"	5.....	0.....	0
For 2.25	"	4.....	7.....	0
For 2.50	"	4.....	2.....	0
For 2.75	"	3.....	9.....	0
For 3.00	"	3.....	4.....	0
For 3.25	"	3.....	0.....	20
For 3.50	"	2.....	9.....	10
For 4.00	"	2.....	6.....	0
For 4.50	"	2.....	3.....	0
For 5.00	"	2.....	0.....	0

This table is subject to alterations for conditions found by the examinations and tests:

First, if the static test, without glasses, showed a + impulse and it remained after the correction of the errors of refraction, we would increase the spherical part of the correction + .50 for 1 to 3 degrees, increase the spherical part of the correction + .75 for 4 to 6 degrees, increase the spherical part of the correction + 1.00 for 7 to 10 degrees,

increase the spherical part of the correction $+ 1.50$ for 11 to 13 degrees, increase the spherical part of the correction $+ 2.00$ for 14 to 18 degrees, regardless of the vision, because the showing indicates spasms of the nervous system which is concealing approximately that amount of hyperopia, as the results after wearing constantly for a few weeks will show.

Second, if the static test, with correcting glasses on, showed a — impulse, we would not add as much to the age for the error as if there were no symptoms of breaking down in the nervous system:

For 2 to 4 degrees we would deduct 25 per cent.

For 5 to 8 degrees we would deduct 50 per cent.

For 9 to 12 degrees we would deduct 75 per cent.

Then there are other things to make allowance for, such as partial presbyopia, previous corrections of errors of refraction — or partial corrections, and other features of the case not exhibited by the static test but by the patient's story, by the ophthalmoscope, by the general appearance, etc. Sometimes there is not enough in one symptom to warrant much allowance, but the total showing does, so we make it that way. This is a point which is difficult to make clear except by personal instruction, over clinics. However, the bright student will catch the idea and soon work it out himself.

As a safe and simple basis to work on, we take the dynamic test, with the correction of errors of refraction, and add to its showing the amount indicated for the hyperopia, (we made no addition if there is myopia), then if the patient is younger than he figures, his condition is below the standard of the class to which he belongs; and if he is more than half way to the showing by the first table he is below the danger-line. Any person who is younger than the first table indicates is practically dead and will need the undertaker very soon.

For example, a patient requires a correction for hyperopia of 1.50 and, with that correction on, shows, by the dynamic test, 8.00 D; we refer to the first table and find the age 26 years, 8 months, and adding 7 years, 6 months, for the error, as required by the other table, gives 34 years, 2 months, as the standard of his class; if his real age is below that he is on the down grade; if it is more than half way down to 26 years, 8 months, he is below the danger line; if he is below the lowest age given it is a hopeless case.

The whole object in figuring out the ages without the aid of the patient is to place the true value on the symptoms found and to prove to ourselves and the patient the accuracy of our system of analysis.

The relation between the dynamic and static tests and the correction of errors of refraction affords a nice little lesson in delicacy of work: First, the dynamic test being voluntary, the patient is liable to deceive us, so the static or involuntary test follows and if they dispute each other

we believe the static, because all positive impulses induced by the defects in the eyes are removed, except when there is tonic spasm; even then we have either the positive exhibit by the static test or there will be so much pain in the eyeballs that we are not in doubt. Second, the dynamic and static tests, with the subordinate ones are constant checks on each other. Third, in persons under 20 years we expect to find great power by the dynamic test whether they are a little weak or not, but if the dynamic test with the correction on shows more power than it did before, we have proof of weakness sufficient to require absolute rest as a part of the treatment, because the near-point of convergence is so close to the face that the limit-angle is reached at the first test. We add the power of the lens to the showing by the first test to get the full dynamic power because the patient must have been accommodating just the amount of the hyperopia more than he showed at the first test. Between 20 and 35 the dynamic test should show exactly as much more power with the correction on than before as the lens represents; if he shows less there is either a mistake in the test or he is in excellent condition—which we would usually be inclined to doubt from the fact that he came for help—but if he shows a greater increase than the lens amounts to it is proof that he is in a weak condition. After 35, until presbyopia begins, the dynamic test should show an increase with correction on equal to at least twice the strength of the lens used; if he does not it is either weakness from causes requiring rest as a part of the treatment or from presbyopia, and we are able to tell which it is by the general showing. No one under 45 should be presbyopic and if we find one we always order rest until he recuperates, when he will not need reading glasses if he will wear his correction constantly—and if he does not he will wish he had when the consequences arrive. He will not be able to secure comfort with any glasses. After 50 presbyopia comes gradually, requiring occasional changes of the reading portion of the glasses, until the full dioptric number for the working distance is accepted, when no more changes will be necessary. After this point is reached the dynamic test will not work until, after completing the correction of the errors of refraction and adding + 3.00 for reading, we require the patient to hold the paper as near to his face as he can read a line, take the measure in inches, express it in diopters, just as in all other cases, but we must deduct the 3.00 we supplied; the remainder will be the showing by the dynamic test, and we get his age from the first table, adding nothing for his error, unless he has worn a correction many years; and even then we would be more liable to add something for his intelligence and education than for any other reason. Fourth, in beginning an examination, when we try the dynamic test, if the patient shows the power of a younger person, according to the first table, we diagnose hyperopia and a vigorous nervous system; but if the static test, which follows,

shows a — impulse, it tells us the nerve demand has weakened the supply, and, at worst, we will only have to contend with a clonic spasm; if the static test shows nothing there may be either tonic spasm or neurasthenia and only the complete examination will settle the question; it is very rarely however, that the dynamic and static tests fail to tell their stories, and, as I have said, the other tests tell which is right when they differ, I may add that when they do fail we still have the others to help us.

The neurometer is not only an invaluable aid in analyzing the condition of the nerve supply but by it we are able to ascertain the seat of the primary cause with reference to whether it is mental or physical or both.

Case I. G. A. M.; a Swede; mechanic, neurotic temperament; height, 5 ft., 9 in.; weight, 130 lbs.; history of malnutrition as child; varicocele since seventeen years old, for which he was operated six weeks previous to examination; appearance, anaemic and neurasthenic; habits, good; diet, —, without much appetite; dynamic test, 6.50; static test, 2° —; vision, L. 20/20, R. 20/15; correction, L. + .75 R. + 1.00; dynamic test, with glasses, 6.50; static test, with glasses, o. k. The fact that the dynamic test, when repeated shows no increase with correction on, indicates powerful control of his accommodation, with a tendency to clonic spasm, so we regard it as a + symptom. We analyze his case as follows:

Dynamic test, 6.50 = 32 years; as left eye fixes, add for + .75, 8 years, 9 months; for mentality, 10 years; total 50 years, 9 months.

This gives a range between the accommodation of an emmetrope at 32 years, and that of G. A. M. amounting to 18 years 9 months, the mid-point between the two being 41 years 4 1/2 months. If he is above it he is in pretty good shape to win perfect health. Speaking strictly physically, if he is above 40 years 9 months he is in good shape and if below 40 years 9 months he is in bad shape, but not dangerous unless he is as young as half way down to 32 years, which would be 36 years 4 1-2 months. Speaking strictly mentally, he must not be less than 40 years 9 months or he would collapse; while his maximum possibility is 50 years 9 months; the mid-point between these two is 45 years, 4 months, 15 days, which we will assume to be his age on account of + symptoms found; if he is older he is in better shape than we figure him; if he is younger he is in worse shape than we figure him, and we will be governed in our prescription by the result of this calculation. A shorter way to make the same calculation, so far as practical results are concerned, is to take his 6.50 D accommodation, which equals 32 years, by table No. 1 of the neurometer, add for the error in his fixing eye 8 years 9 months, as per table No. 2, less 33 1/3 % for his history, leaving 5 years 10 months, then split the difference between the minimum (5 yrs.) and maximum (10 yrs.) adding 7 years 6 months for his mentality, making a total of 45 years 4 months. He was on the date of examination 45 years 4 months 11 days old; showing by the first calcula-

tion, four days to the bad, and by the second calculation eleven days to the good. All of which proves the greatest drain on the nerve supply has been in his mental department. Part of it is accounted for by his abilities as a mechanical inventor, and part by the trouble from which he suffered so long.

Case II. Dr. Walter, an oculist, practiced for twenty years; history, indigestion, headaches and "catarrh" of gall bladder; difficult to get story as he insisted on ridiculing the neurometer, and afterwards beat the college out of a son's tuition fee; arteries, o. k., veins a trifle dark; dynamic test 4.25 static test 4° — impulse; vision, L. 20/30, R. 20/20; never wore glasses and declared he had no defects in his eyes; correction, L. $+ .50 + .50$ ax. 90; R. $+ .50 + .50$ ax 90; dynamic test, 5.25; static test 1° —. The neurometer indicates 37 years for 5.25 D. accommodation and his meridian of greatest hyperopia was 1.00 D., for which we add 10 years, because his — symptoms were offset by the $+$ symptoms, making him 47 years old. The examination was made on the 18th of December, and one of my pupils who did it, threw off one month for the 1° — symptom by the static test, after correction, so that it figured 46 years 11 months, and as the patient admitted he would be 47 January 24th, the calculation showed him to be six days to the bad. Note, we add nothing for his mentality. He had none worth mentioning.

Case III. C. M., teacher; temperament $+$; appearance, healthy; complained only of tired feeling and sleepiness when trying to do close work; formerly had dyspepsia, headache, catarrh; had worn glasses many years which proved the proper correction; dynamic test, 1.75; static test, 7° — impulse; correction, $+ 2.50 + .50$ ax. 90, each eye; dynamic, 5.25; static test, 4° — impulse. In this case, glasses having been worn constantly, and the dynamic test showing less than 7.00 D., we suspected presbyopia which was corroborated by the fact that the increase in the showing, by the dynamic test, after correction was only slightly greater than the amount of the error in the worst meridian; that he was short on nerve supply is shown by the static — impulse after correction and by the fact that he accepted readily $+ 1.50$ addition for close work. The fact that he had been wearing his correction several years, thus being practically an emmetrope, made it necessary to make calculation as follows: He worked at a near point about nine hours daily, six of which are extra for which the neurometer says add 10 years to his showing, because, under such conditions the nerve demands about equal those of 1.00 D. hyperopia, but we deduct 25% for — impulse by the static test and 25 % for partial presbyopia, leaving only 5 years to be added for his close work. His 5.25 D. accommodation showed 37 years, to which was added 3 years 4 months for his error, and 5 years for extra work, making him 45 years 4 months on the date of the test, and he was 45 years, 4 months, 28 days,

or 28 days to the good. His mentality was figured in his extra hours' work.

Case IV. Miss B., clerk; appearance, fairly good; complaints, dysmenorrhoea, headaches, difficult urination, up a dozen times nightly, and more often during the day; hyperopia, 3.25; dynamic test, 4.00 D. before correction and 7.00 D after, static test, 4°—before and 4°—after; her accommodation after correction indicated 30 years, her error called for 3 years, 1 month, 15 days to be added, and, on account of the + symptoms shown in the general examination no allowance was made for the — ones except to add the minimum for her work, which is 5 years, aggregating 38 years, 1 month and 15 days. She was 38 years, 3 months, thus showing 45 days to the good.

Case V. Father B., priest; appearance, fair; complaints, catarrh, indigestion, headaches; dynamic test, 8.00 and 9.00; static test o. k.; error, hyperopia, 1.25. The neurometer shows 23 years, 4 months for his accommodation, 8 years, 9 months for his error, and the minimum of 5 years was added for profession to allow for his — symptoms, which were not serious, inasmuch as he did little close work; total 37 years, 1 month; he was 37 years, 2 months, 17 days.

Case VI. Mrs. T.; wife; tired from doing nothing but the society drag; prolapsus and "adhesions;" in general the + symptoms almost equalled the — ones; accommodation, 5.50, indicating 36 years, to which was added 6 years, 3 months, less 10% for her mental disturbances over old school doctors' stories, or 5 years, 7 months, 15 days; making a total of 41 years, 7 months, 15 days. She was 41 years, 8 months, or 15 days to the good.

Case VII. Mrs. P., trained nurse; anaemic and neurasthenic; history of endometritis for nineteen years; came from hospital where she had four weeks' rest after a curettement; had been operated for "floating kidney" two years before; rheumatism in arms and feet; cold feet and hands; weighed 119 1-2 lbs; had worn + 1.50 for several years; error + 3.00 accommodation 8.00 D., equals 26 years, 8 months; adding 3 years, 4 months for the entire errors, and 7 years, 6 months more for mentality made a total of 37 years, 6 months. She was 38 years, 3 months, or nine months to the good, on account of her rest at the hospital, which was the reason no allowance was made for her symptoms, except in adding for the mentality. After twenty days further rest, on strict diet, she went to work, stronger than she had ever been, and weighing 137 1-2 pounds.

Case VIII. Miss C., teacher; divergent squint; anaemic, neurasthenic, sore spot in back, couldn't wear corset, headaches, constipation, indigestion; measured 8.00 D., or 26 years, 8 months, and 1.50 hyperopia, for which was added 7 years, 6 months, making 34 years, 2 months. Deducting for her — symptoms, 25% for the squint, 50% for the anaemia and neurasthenia, 25%

for the sore back, and 50% for the headache, indigestion, etc., aggregating one and one half times the amount added for the error, or 11 years, 3 months, from 34 years, 2 months left 22 years, 11 months, and when she said she was only 22 years even, I informed her if she recovered it would be a triumph for neurology as she was below the dead-line. I fixed her back in half a minute, straightened her eyes in two days, and when she showed amazing improvement in four days I let her go home where she would have absolute quiet. In three months she reported well, gained 21 pounds and was wearing a corset with comfort.

A MUCH MOOTED QUESTION.

How to Treat Cross-Eyes and Alleged Muscular Insufficiencies.

It is more than passing strange how the medical profession accepts assertions from self-constituted authorities without putting them to tests. Long ago some writer declared that cross-eyes are caused by paralysis of one of the sixth cranial nerves which operate the external recti, and it has been taken as indisputable, when if the author of the assertion, or those who read after him had possessed a modicum of knowledge of the mechanics of anatomy and of the possible causes of derangements they could have proved in one minute, or less, that the assertion had no foundation in fact. The test is a simple one: cover the fixing eye and direct the patient to fix with the other, without turning his head. If he does it, and I never found one who could not, unless the eye was blind, it is positive proof that the nerve is not paralyzed. Then it ought to occur to a thinking doctor that it would be a queer state of affairs if one of a pair of nerves should be paralyzed and no others suffer the slightest. It is not impossible, but is highly improbable.

Again, it is a common fault among doctors to be satisfied with one theory of cause and not look for others. They wait for the leaders to make discoveries while they maintain the code of ethics' "air of peculiar reserve" toward the laity and talk about the progress "we" are making. I have never seen a case of convergent cross-eyes that were not produced by one of two causes, ametropia or operation. It is true many cases appear after the spasms of whooping cough or irritation or exhaustion from other disorders, but the primary cause was defect in the physical proportions of the eyes. This has been proved hundreds of times by myself and my pupils by correcting the defects, or overcorrecting them for a time, when the eyes straightened without further assistance. It is very rarely that operation is needed and when we are a little wiser I am sure it will never be done.

In cases of cross-eyes, from other cause than operation, both eyes deviate, but the necessity for vision impels the fixing of one eye by the controlling center, (one of the most perfect illustrations of Nature's power of adapting herself to circumstances), while the other is permitted to do

all the turning. Sometimes the eyes alternate in fixing and as such are the easiest to straighten by our method we have learned that it is a good idea, in other cases, to first create this tendency by covering the fixing eye and compelling the other to fix. In little children we are often able to straighten the eyes without glasses by using such tactics and strengthening the general nerve supply by a positive diet. Of course, if that fails we know it is because we did not remove the cause, and we resort to glasses. The only reason we do not put glasses on in the beginning is that while we know the error of refraction is there, we know that if a system is in perfect order, in every other particular, the excess nerve de-

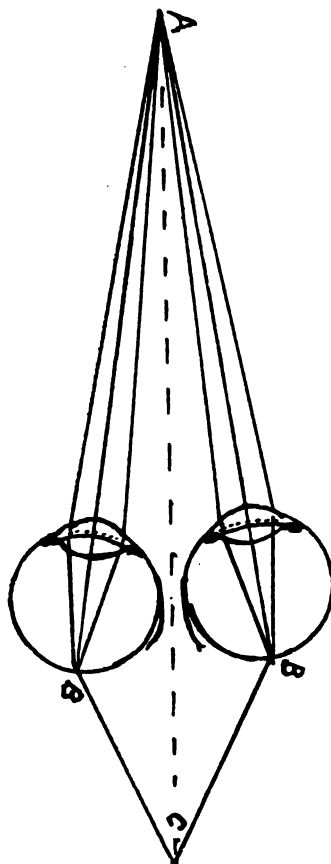


Fig. 66

mands of the eyes can be supplied without danger to health, at least for several years, and it is to let the little one go without the inconvenience of glasses if possible. Of course, if there are complications, such as headache, constipation, fits, etc., we use every precaution to insure winning from the beginning. Then, occasionally, when the child has grown strong, we try laying aside the glasses, always remembering and informing the guardian:

that in so doing there is some risk of the eyes crossing again; but if they do, we can do the work over.

The manner in which hyperopia causes convergent strabismus will be understood best by first comprehending the normal relation between convergence and accommodation.

Fig. 66 shows the two eyes fixed on a point, A, say 13 inches distant, the axes of the two eyes each turning in to the median line, and the accommodation working so that A and B B are in conjugate focus. The latter, being two independent duties, each requires 3.00 D. effort from the nervous system, while the former, being a joint duty, only requires a total of 3.00 D., or 1.50 each, delivered through the internal recti muscles from branches of the third nerves that operate the accommodation. All is under direction of the controlling center, C, back in the brain; it, in turn receiving its impulses from the nerves of sensation, the second or optic nerves. As this is the natural situation, and as such functions belong practically to the sympathetic or involuntary system, let us express it as follows:

An emmetrope working at 13 inches requires from the nervous system:

	L..3.00.D.	
For Accommodation		Total 6.00 D.
	R. 3.00 D.	
	L. 1.50 D.	
For Convergence		Total .3.00.D.
	R..1.50.D.	

Grand Total.....9.00 D.

In order to put this in still more comprehensive form, let one second be the unit of time in our calculations. Thus, if it requires 9 D. for one second at the 13 inch point it will require 60 times 9 D. per minute or 540 D., and 60 times that per hour, or 3240 D.; the average number of minutes close work daily averages only about three hours, so that the total demands of these two functions is only 97,200 D. daily.

Now take a hyperope of 3 D., who must use his accommodation unnaturally on account of the defect in the form of the eye-balls, but who has exactly the same anatomical relations between accommodation and convergence. He cannot accommodate without converging and while the accommodation only brings his retina in conjugate focus with objects at infinite distances, his convergence brings the axes to a point 13 inches away. The only things left for the controlling center to do are, either fix with one eye and let the other turn in toward a point 6 1/2 inches from the face, or send enough energy to the external recti, over the sixth nerves, to hold the axes parallel in spite of the convergent pull. Thus, there is a two-fold strain on the hyperope: First, his demand is all in excess of normal; second, it forces nerves which ordinarily work alternately to work at the

same time. It follows, naturally, that when the nerve supply under control of C becomes weakened, the first place the innervation is withdrawn will be from the sixth nerves, thus after an attack of acute disturbance, such as typhoid, scarlet fever, diphtheria, or weakening from other cause, the eyes are liable to cross. Or, if there be spasms, such as from whooping cough, the irritation would give the third nerves an advantage over the sixth and the eyes may turn.

The nerve demand in a hyperopia of 3.00 D. would be as follows:

	L 3.00 D.	
For Accommodation		Total 6.00 D.
	R. 3.00 D.	..
	L. 1.50 D.	
For Automatic Convergence		Total 3.00 D.
	R. 1.50 D.	
	R. 1.50 D.	
For negative pull, via 6th nerves, to prevent convergence		Total 3.00 D.
	L. 1.50 D.	
Grand Total.....		12.00 D.

Therefore, 12 D. for one second means 720 D. for one minute, 43,200 D. per hour, and 691,200 D. per day of 16 hours, which is the average time people are awake daily. Then if this person is required to do the average number of hours close work daily his total demand is 788,400 D. daily against the normal demand of only 97,200 D. Is it any wonder he becomes cross-eyed? Is it not remarkable that there are not more cross-eyed ones? Is the assertion that eye strain is one of the chief causes of human ills a claim to be ridiculed or disputed? It is only done nowadays by utter ignoramuses.

The philosophy of my treatment of convergent squint should be clear now: Simply correct the error that requires the accommodation thus doing away with the cause of convergence, which in turn makes the divergent pull unnecessary. This is the proof that every + sphere, worn constantly for the correction of hyperopia, saves twice as many nerve units per second as the lens has units of power. But it is not so simple a proposition when it comes to the solving practically. The operator must not only know the anatomy and physiology of the eyes particularly and of the system generally, the sympathetic relationship between organic functions, etc., but he must know physics and mechanics and have a natural tact and adeptness, not possessed by everyone, to measure the errors correctly. The assertion by some would-be oracles that none but physicians are competent to fit glasses to the eyes is foolish in view of the fact that very few physicians ever used a set of trial lenses or received any instruction whatever about eyes, except possibly something about pathology of the eyes,

and that was false. Ask the first ten physicians you meet; be practical. The assertion is on a par with another, by the same wiseacres, that no one can get an eye correction without first using a cyclopegic. They are the same individuals who declare that the old schools of medicine have patent rights on all discovered or undiscovered methods of relieving human ills, and expose themselves to ridicule and fear for their sanity by saying: "It is better that a patient die in the hands of a regular physician than recover under the ministrations of an empiric." It is the favor new schools are meeting in the estimation of an intelligent public that drives them frantic.

A neurologist, treating convergent squint, begins by disregarding vision to the extent of prescribing, for temporary wear, such + glasses as will blur the vision of the fixing eye for distant objects until it is worse than the other, provided, always that the other has enough to enable the patient to see sufficiently to take care of himself. Often, on returning in a few days, vision will have improved very much; then we blur some more, until the spasms in the ciliary nerves and those of the interni have relaxed and the eyes are straight, when, if vision is not perfect, we give the correction that will make it as nearly so as is possible. Sometimes the blurring process is not successful because the temperament of the patient is such that he adapts himself too readily to any situation. In such instances we reduce the blur for a few days to excite the desire to see, and thus set up influences for reaction. If one eye is totally blind it makes little difference in the proceeding; we blur the good eye to about 20-50 or 20-60, stop all close work and get the system in good condition by diet, rest, etc., as we should do in all cases, when the blind eye will straighten, affording the best possible proof our philosophy is correct. If one eye turns up or down, treat in the same manner.

If the deviation is outward it is from deficiency to the point of exhaustion at the time it occurred, or from blindness in one eye which disconnected it from the controlling center. Theoretically the practice suggested for convergence should not work, but by modifying it a little we are often able to get fine results, provided the deviating eye can see. If the patient's nerve supply measures below normal we blur the good eye and barely correct the other, to force it into action, then tone up the system with dietary, rest, etc. In all cases no harm is done by having the patient turn the deviating eye to the opposite side as far as possible, the lids being closed, then the operator holds it by gentle, firm pressure, while patient tries to turn it back; teach the patient to do it himself at frequent intervals.

The length of time required to complete the work of getting cross-eyes to work together, straight, varies, from a few seconds to several months. Something depends on the mentality of the patient and something on the physical temperament, just as in all other things. The operating fiend ob-

jects that it takes too long. We reply that operations made unnecessarily are a crime, hence nearly if not quite all cross-eye operations are crimes. He says, "But your patients have to wear glasses." We reply, "So do yours; if they do not they soon require another operation, and another until the eyes are finally worthless." Almost half of the total number of divergent squint cases I have met testified their eyes formerly turned in but were operated, then turned out, and they were afraid to let the alleged surgeon do any more cutting. There is also more or less danger of blood-poisoning after operations.

But cutting muscles for cross-eyes is a mild crime compared with the slashing oculists do for that myth "muscular imbalance." I have made an assertion and the proof is due. First, let me make others and I will then proceed to prove all at once: They all apply what they call muscle tests. The first one comprises the Maddox rod, or double prism on one eye and a colored glass on the other. Let the colored glass be on the right eye for this illustration. When adjusted properly and looking with both eyes the patient should see the colored light in line with and midway between the other two, all in a vertical position, and when he does it is called orthophoria or a normal state; but if the red light is seen to the right they say the right eye is turning in from a weakness of the external rectus muscle, and as esophoria means a tendency inward they apply that word to the condition and declare they must cut the internal—because the external is weak! If the red light appears to the left it means to them that the internal rectus of that eye is weak—and they cut the external! They call this exophoria, because they think the right eye turns out. If the red light appears above the mid-point they call it left hyperphoria, and if below that point, right hyperphoria—one of them calls it left "cataphoria," but as catoptrics is the science of reflections we pass him. They apply the term heterophoria to all deviations. To recapitulate briefly, they say that in all imbalances the fault is in the muscles, that it is always weakness of the muscle on the opposite side of the eye from the way it turns and that the eye turns opposite to the way the light deviates. I say, both eyes turn, which is easily proved, theoretically, by the anatomical and physiological relationship existing between them, and practically by reversing the prisms and colored glass, the latter being on the left eye will show as much deviation as was shown by the first. I am almost afraid to tell them this lest they cut the muscles of that eye too. And, lest someone be misled by a difference in the amount of deviation when the test is made, let it be remembered that repeated tests with the first arrangement will often show different amounts of prism required to get the lights in line, just as the patient grows more passive or more irritated by the test. I say, further, that in the so-called heterophoria the eyes deviate the same way the lights appear to, hence what they call esophoria is really exophoria and what

they call exophoria is really esophoria, while what they call right hyperphoria, that is, right tending upward, is really a downward tending, and when they say it turns downward it is really tending upward. Also what they call hyperphoria is often a vertical squint or hypertropia, as they would call it, to class it with cross-eyes. Finally, I say what they call muscular imbalance is not muscle trouble at all, but is due solely to irritation or weakness of the nerve supply in the cerebellum. All of which, if true proves their operations to be crimes, committed through ignorance or willfully. The reason I added the word "willfully" is because, if they find the eyes in perfect balance by the test described they have another called the deduction test, which they apply, after having fixed an arbitrary standard of power each set of coordinate muscles should exhibit and if one set shows more power than the standard they cut it; if it shows less, they cut its antagonist. They put on strong prisms, apices over the muscles to be tested and

The interni must overcome not more than 24° or less than 20° .

The externi must overcome not more than 8° or less than 6° .

The superior must overcome not more than 4° or less than 3° .

The inferior must overcome not more than 4° or less than 3° .

Thus they discover what they call "latent" muscle troubles. One of my students, aged 60, exhibited by this test, 8° with the interni, 3° with the externi, and 1° with the superior and inferior, so I wrote one of the partisans of the test to find which muscles to cut, inasmuch as by his theory they all should catch it, but I never received a reply. I did not expect one.

Now for the proofs: None will deny that motor nerves are the sole source of power to move muscles voluntarily. All will admit a certain elasticity of the fibrous structure, but it is always negative in straight muscles. Hence muscles are only the mediums through which nerve force is applied, just as engines are only the mediums through which steam and electricity are applied. Then, if we have a case of spasm of accommodation it is irritation of the nervous system at being called on to work overtime, and it is but natural that other branches of the same nerves would feel the extra current, particularly those operating the coordinate function with accommodation, namely, the convergence, and, when the double prism and colored light test is applied we would expect the eyes to deviate inward as soon as control was taken from C, (Fig. 66), and if the eyes carry the lights in the same direction they turn, the red light, on the right eye, should appear to the left of the others, while the others should appear to the right of the red; in other words the lights should cross over because the axes do. Now let us see if they do.

First take a vigorous person with no presbyopic tendency and put the double prism on the left eye, the other being covered, and have him look

at a small spot, say as large as a pin head, on a piece of white paper at about six inches from his face, and adjust the prism so he sees two spots in a vertical position. Note how the eyes are converging, then uncover the right eye, when he will tell you the middle spot is decidedly to the left. Then take a person with a presbyopic tendency, but who can still accommodate some, and try the same test, when his right eye will fail to bring the middle spot even with the others. Then draw a line through

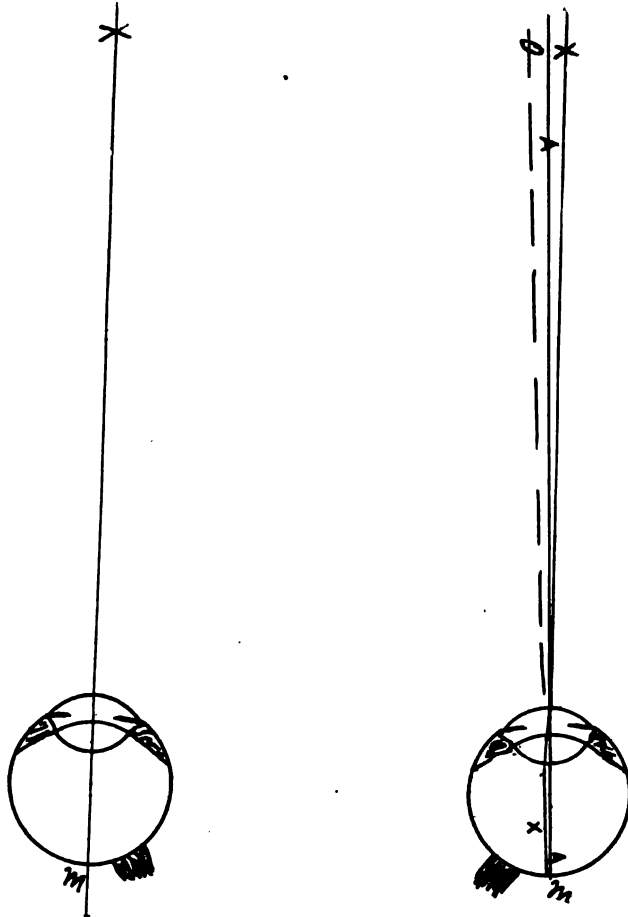


Fig. 67

the spot and repeat the test on both, when, unless the first one has a tonic spasm, or cramp, he will see all the spots on the line, and, the second will do the same, unless his presbyopic tendency is very strong. This experiment proves two things: First, that the object deviates the same way the eyes turn; second, that the dot-and-line test as they use it, to find "heterophoria at the near point," is worse than worthless.

Fig. 67 shows an esophoria, or inward tending of the eyes, under the test. I have drawn the deviation all in one eye in order to make the illus-

tration simpler. The left eye, with the double prism, sees two lights at twenty feet, one above and the other below the axis at the macula because the prisms are of equal strength; and its axis is in direct line with the real light, because we permit the patient to fix before uncovering the other eye. The other, when uncovered, gives way to the positive or negative impulse present because the two eyes are thrown out of gear and the controlling center, not being able to fuse its image with the other two, simply lets it drift with general conditions. In this case it is a positive impulse, also exhibited by spasm of accommodation and of sphincter nerves throughout the body, so the axis A turns in from the normal line X which is the exact direction of the object. The turn is so slight, however, that the ray, X, crosses the axis, A, before reaching the lens, and is broken back toward the axis so that it strikes the macula as nearly the center as either of the images in the other eye can be, and, as the direction from the lens to M is as if the ray came from O, the light appears to be at O. If from weakness of the supply to the third nerve branches the eyes deviate apart when thrown out of gear, the lines O and A would be on the other side of the line X. The prism, apex toward the position where the center light should be, which puts the deviating lights in line, does not, as they think, measure the amount of the deviation in degrees. It merely indicates the relative intensity of the spasm or the extent of the weakness in the nervous system, as is proved readily by measuring the distance of the deviation in inches and observing that while it may remain the same at different tests the amount of prism required to supply the impulse to put the lights in line is variable. Also, one person, with a deviation of twelve inches, may require a 12° prism while another with greater deviation may need less. The best way to take these measures is to have a strip of white paper several feet long on the wall, with the light hanging exactly in the middle, and through the middle of the paper have a plain, black line, half an inch wide, with vertical lines drawn through it every few inches. This will appear in duplicate through the double prism; then have the patient tell where the red light is with reference to these lines.

The neurologist uses this test, not as a muscle or eye test, but as a static test of the state of the general nerve supply. He would no more think of prescribing prisms for such deviations than he would think of cutting muscles, and he would no more cut muscles than he would cut throats. We never supplant nature, and we never try to assist her unless we know exactly why we do what we do. When this test is off, the eyes are in gear and the controlling center supplies all the impulse necessary.

Then there is another "phoria," called cyclophoria, in which the eyes turn on their optical axes and present oblique astigmatism when the principal meridians should be vertical and horizontal. If there is a spasm of the nervous system it may exhibit in the inferior oblique muscles and

pull the eyes inward below, rolling the tops outward, or, if there is nerve exhaustion, the inferior oblique will be enervated, letting the superior oblique pull in at the top, from its elasticity, when there is less resistance than usual, rolling the lower parts outward. The reason in both cases is that the inferior oblique is operated by the same nerves that supply the accommodation and the internal recti, hence the tension, or lack of it, on all muscles operated by the same nerves. A test for cyclophoria, which is not reliable, however, is to put the double-prism on one eye and adjust it so that a patient looking at a horizontal line, about half an inch wide and fifteen or twenty feet away, will see two; then uncover the other eye when he should see a third, midway between and parallel with the two seen by the first eye. If the nasal ends tilt downward, the principal meridians nearest horizontal are tilting upward, indicating a spasm of the nervous system, exhibited in the inferior oblique muscles; if the nasal ends tilt upward it indicates the principal meridians are tilting downward from nervous weakness, exhibited through the inferior oblique muscles. This is just opposite to the indications by the test with cylinders, when there is

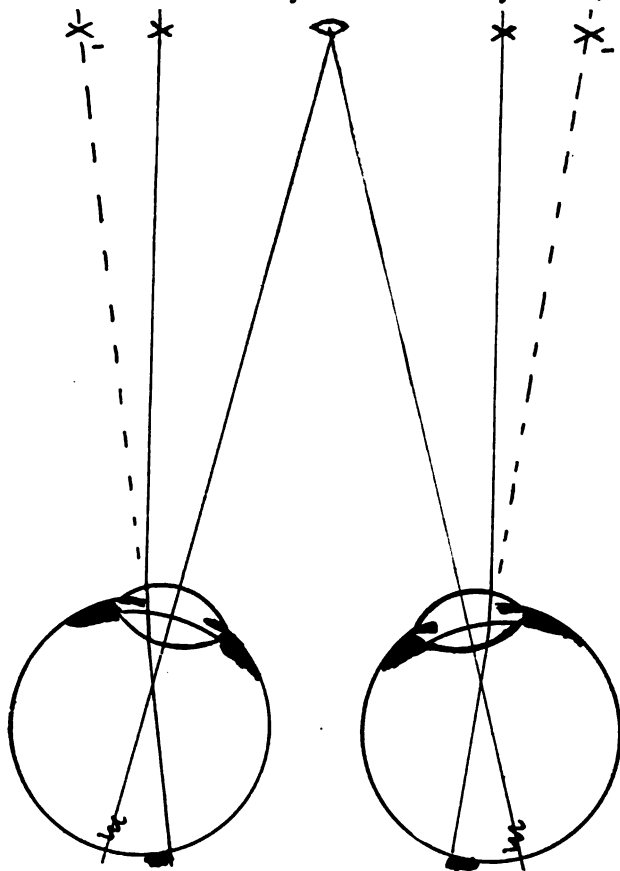


Fig. 68

astigmatism, because then we have the positions of the principal meridians indicated by the axes of the cylinders. The reason the prisms and line test is worthless is the same that makes the dot-and-line test a nullity, viz.: the lines offer the controlling center a guide and it often takes the hint disclosing no disturbance because the parallelism of the lines is maintained. In all cases where there is doubt about the location of the axes, prescribe temporary + spheres. It is proper to say that when astigmatism is great enough to impair vision seriously it rarely creates nervous effort enough to upset the system.

The treatment indicated by + impulses is stop the cause of spasm by correcting the hyperopia and the symptoms dynamic and static will soon disappear. If there are — impulses they mean rest in addition to the correction. In connection with both we find, often, other causes of disturbance and we remove all of them without operation, except a few hopeless cases who must be content to take the chances of operation, which, if successful, can only keep alive what is left; they are never whole afterward. We send them to those who boast they would rather operate than eat—we prefer to eat and think we are greater surgeons when we can save a person whole than those are who take chances wholly unnecessary and refuse to investigate our methods, but, nevertheless, condemn them even to libeling us.

"But," you say, "how did your opponents get the idea that in heterophoria the eyes deviate opposite to the way the lights do?" All right, I'll answer that too.

Fig. 68 shows two eyes fixing on a point six, or eight, or more inches away, and X X represent rays coming from a light fifteen or more feet distant. While only one image of O will be conveyed to the brain, there will be two of the distant object; they will be imperfect, that is, not clear, because the eyes are in conjugate focus with the nearer point and because the retinal impressions are not made on a highly sensitive part—some of the image falling on the blind spot—and as refraction by both cornea and lens is in the outer hemisphere the lights appear in the directions $X^1 X^1$ on the dash lines. This is because the convergence of the two eyes is beyond the limit angle. The reader may try this and will find it true that when the eyes' axes turn so much with reference to a line toward a distant object, the object will exhibit the opposite deviation.

Fig. 69 shows a left eye fixing and the right doing the turning perceptibly, so that a ray from the object O appears as if located at O^2 . If the eye turned out the lines Ax and O^2 would be reversed. When we are working with cross-eyes and the patient complains of seeing double we know we are getting along with the case nicely and as soon as the controlling center gets a hold the eyes will straighten and remain straight. Usually the deviating eye turns enough to let the image fall on its blind

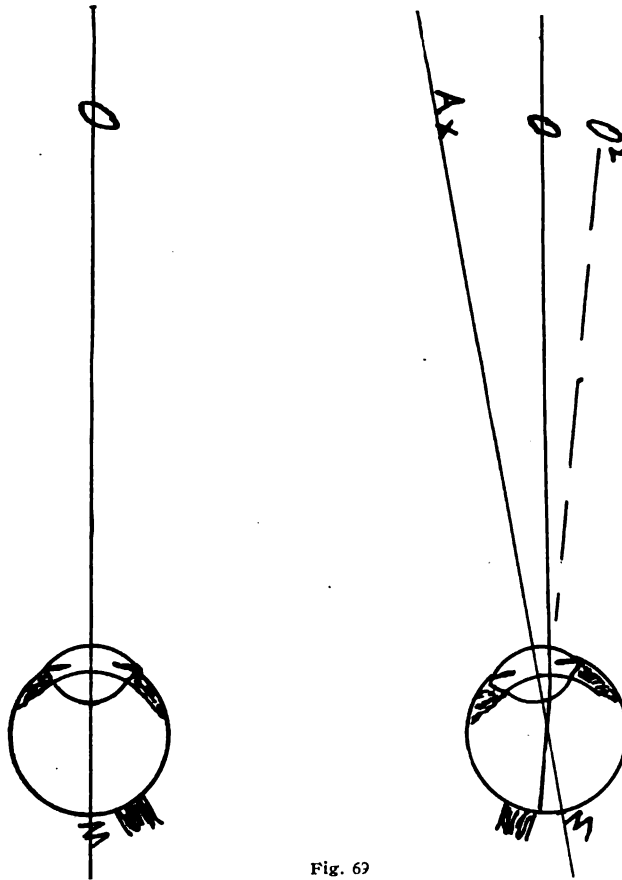


Fig. 69

spot so it does not send any image to the brain, which relieves mental worry.

Fig. 70 shows another situation which the reader may try. Fix the eyes on the distant object so that the axes are parallel, as are X X in the cut, then hold a pencil, or the finger, a few inches away, when there will appear to be two, the right eye seeing the one on the left and the left eye seeing the one on the right, as shown by the dash lines. This is because the visual axes are beyond the limit angle for rays from the near point. This shows how, if the eyes turn out a distant object would be seen as two, deviating opposite to the direction the eyes turn, except when they turn so far one does not participate in vision at all.

My answer then, is: My critics think because the lights deviate opposite to the turn of the eyes in strabismus it must be true in all cases, whether the eyes turn perceptibly or not, which proposition is false as I have proved, anatomically, physiologically, physically and clinically here, while several hundred pupils and myself have proved it in practice so long that it seems almost absurd to give it so much space at this time.

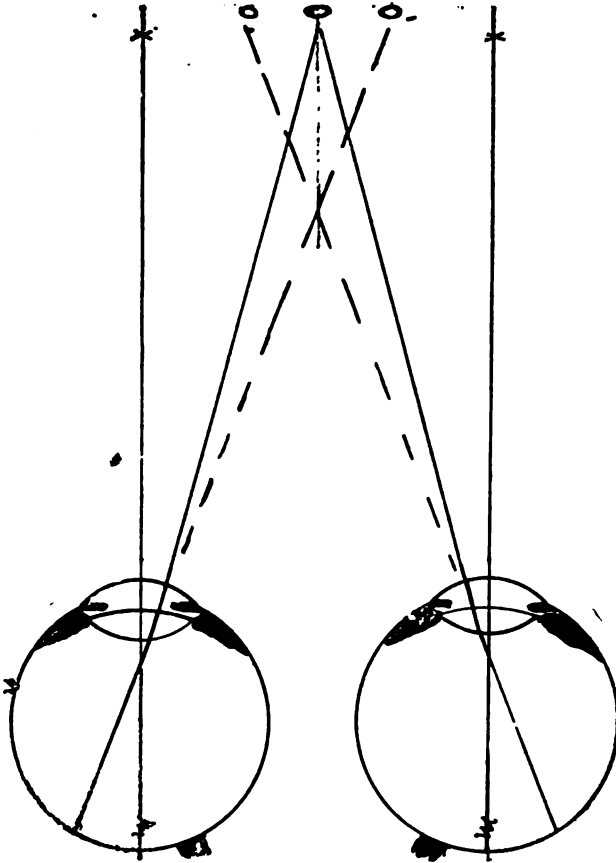


Fig. 70

So long as the deviation of the eyes does not disfigure the appearance there is no squint and when there is squint there is no need for a muscle test to tell which way the deviation is. When there is no deviation except as exhibited by the test the eyes always deviate in the same direction the lights do. I think that is stated plainly enough, and proved by the figures.

Vertical deviations show squint and exhibit diplopia with less amount of turn than in any other direction because the superior and inferior recti are operated by the same nerve branches and thus reach their limit angles quicker as is illustrated by the duction test.

SOME PRISM FIGURES.

Which Prove the Fallacy of Claims for Them as Therapeutic Agents.

As refracting mediums and therapeutic agents prisms offer two distinct propositions. The first has been treated in the chapter on physics and the other is due to receive attention.

Take an emmetrope, or an ametrope, in good condition, so that the static test shows the three lights in line, and watch his eyes as you drop

in front of one of them a 10-degree prism, base out. You will see them turn in perceptibly. The one on which the prism is placed will turn in at once while the other will turn out first, then in, as soon as it finds the first stops. This is because the first impulse to the other eye was transmitted by way of the optic commissure and the second by the controlling center when it discovered the situation. Now make a long horizontal line on the wall, in the middle of it hang a light; on either side of the light draw short vertical lines about two inches apart, making them plain enough to be seen readily; then, with the two lights seen through the double prism and the red one seen by the other eye, all in line, suddenly impose a 4-degree prism base out in front of the red glass and have the patient state the amount of the deviation caused by locating the position of the red light with reference to the short vertical lines, which will of course appear as two sets through the double prism (have patient ignore all seen with the red eye, excepting the light). Remove the trial frame and take two strings, each long enough to reach from the patient to the wall; have him hold two ends, one under each pupil, while the operator takes the other two ends and holds them taut at the points where the light is and where the displacement located it, the string from what was the red eye running to the displaced position and the other to the real position. These represent the true visual axes of the two eyes under the test and the distance from the face to the point where they cross shows the exact angle of convergence caused by the prism. It will be found to be approximately one meter in tests of normal eyes, hence we know that a 4-degree prism base out causes practically one meter-angle of convergence, requiring .50 D. effort in each eye. Inasmuch as when such effort is caused in a natural way by a demand for accommodation, and as putting prisms on emmetropic eyes (or on fully corrected ametropic eyes), causes dimness of distant vision, we know the impulse to converge, even when caused artificially, brings with it the proportionate amount of accommodation, we have the figures for the nerve strain which would be caused by such prism as follows:

Convergence	L .50.	
	R .50.	Total 1.
Automatic Acc.	L 1.00.	
	R 1.00	Total 2.
Grand Total		3 D. per second.
		60
		180 D. per minute.
		60
		10800 D. per hour.
		16
		172,800 D. per day of 16 hours.

In a hyperope of 1.00 D. the same prisms could be used to advantage because they would save one-fourth of the abnormal demands, thus:

Accommodation	L 1.00	
	R 1.00	Total 2.
Auto-convergence	L .50	
	R .50	Total 1.
Negative pull by	L .50	
external recti to		
prevent convergence.	R .50	Total 1.
	4. D. per sec.	
	60	
	240 D. per min.	
	60	
	14400 D. per hour.	
	16	
	86400	
	14400	
	230,400 D. Daily 16 hrs.	

The prisms, making the convergence a necessity while the accommodation adapts the focus, the negative pull is not needed, and, as it constitutes one-fourth of the total the prisms save 57,600 D. daily. But would not a doctor be a chump to save that when he could, with a simple pair of + spheres, save the whole 230,400?

Here is another notable thing: If the prisms be prescribed in combination with the sphere the effect would be just the same as with the prisms alone, for, the prisms alone save 57,600 out of 230,400, leaving the net strain 172,800, while in the combination the lenses would make the eyes emmetropic and we have shown that the strain on an emmetrope is 172,800.

Here is another: A pair of + .75 lenses each ground in combination with 2° base out, would be exactly neutralized therapeutically, except the psychic effect.

Accommodation	L .75	
	R .75	Total 1.50
Auto-convergence	L $.37\frac{1}{2}$	
	R $.37\frac{1}{2}$	Total .75
Negative pull, . .	L $.37\frac{1}{2}$	
6th nerves.	R $.37\frac{1}{2}$	Total .75

Grand Total 3. D. per sec.

$3 \times 60 \times 60 \times 16 = 172,800$ D. daily.

The correction makes patient emmetropic and saves the above amount, but then the prisms come in and cause:

Convergence	L .50	
	R .50	Total 1.
	L 1.00	
Automatic Acc.	R 1.00	Total 2.

Grand Total.....3. D. per sec.

$$3 \times 60 \times 60 \times 16 = 172,800 \text{ D. daily.}$$

Then take a hyperope of 1.00 D. and correct the error, but combine 4° prism, base out, with each lens, and the effect would be: The spheres make an emmetrope and save 230,400 D. daily, but the prisms cause two meter-angles convergence and total nerve strain, thus:

	L 1.00	
Convergence		Total 2.
	R 1.00	
	L 2.00	
Automatic Acc.		Total 4.
	R 2.00	

Grand Total.....6. D. per sec.

60

360 D. per min.

60

21600 D. per hr.

16

129600

21600

345,600 D. daily.

or exactly the equivalent of the strain caused by 1.50 hyperopia. The same result could have been obtained with a pair of — .50 spheres.

Take a hyperope of 3.00 with a total strain of 691,200 D. daily and give him + 2.00 $\odot$ 2° base out, each eye, and the lenses will save 460,800, while the prisms save one-fourth of the rest or 57,600, a grand total of 518,400 out of a possible 691,200; but if + 1.00 had been added to the lens instead of the prism, the whole would have been saved.

Take the same case and combine with the + 2.00 lenses 4° prism each and the effect will be that the lenses, leaving 1.00 D. hyperopia uncorrected, would mean nerve strain

	L. 1.00	
For Accommodation		total 2.
	R. 1.00	
	L. .50	
Auto-convergence		total 1.
	R. .50	
	L. .50	
Negative pull		total 1.
	R. .50	

Grand total.....4. D. per second.

But when the prisms get in their work the result is different. They cause a strain as follows:

	L. 1.00	
For convergence		total 2. .
	R. 1.00	
	L. 2.00	
Auto-accommodation		total 4.
	R. 2.00	

Grand total.....6. D. per second.

There would be some benefit even from this combination because the original strain, from the error, was 12 D. per second and half of it would be saved; but if the prisms were left out two-thirds would be saved.

The whole matter resolves itself into this: If 4° base out causes 172,800 D. daily strain on an emmetrope, whether naturally so or made that way artificially, 1° would cause 43,200 D. daily up to the limit of capacity to overcome prism degrees, and to find the damage any amount of prism base out will do, multiply the above figure by the strength of prism. The reason prisms do not always do harm is because the doctor unwittingly leaves part of the hyperopia uncorrected or the benefit from the spheres is so much greater than the damage done by the prisms that the net result is good. But neither the prisms nor the doctor deserves any credit.

We are not yet able to measure the exact strain when the prism is base in, but it is a reasonable estimate to put it at about one-fifth as much as if base out, because it bears on the 6th nerves which have no branches, while the 3d have five principal ones, therefore each degree, base in, would cause 8,640 D. daily strain, up to the limit of capacity to overcome them. Base up or down, would bear on 3d nerves again and we estimate the strain at one-third as much as if base out, or 14,400 for each 1°

The capacity of the interni rarely exceeds 20°; that of the externi 6°; that of the superior and inferior recti 3°.

To test the pulling powers of prisms within the limit, and the non-pulling powers of those which exceed the limit, take a 2° , hold it base down in front of one eye, both being open, and look at a light several feet distant, when it will appear as two; fix on it until it appears single, then withdraw the prism. If it does not pull when put on it will as it leaves. Then try a 10° in the same manner and there will be no pull because the job is such a big one there is no effort to do it.

Possibly some eye doctors who have been prescribing prisms with varying results will now be able to see why they won when they won and why they failed when they failed, which was frequently.

"But," someone says, "What are you going to do about the muscles when tests indicate prisms are needed?" I deny there are any such cases. with the possible exception of a lack of ability in some old people to converge or in a myope who tires at close work or without correction, when prisms, bases in, might be used for reading only, in connection with the additional spheres required in the case of the presbyope and without lenses for the myope; I never saw but one person who required them even for that purpose. In case of such need, however, here are the figures:

For 1 meter-angle 4° base in, part in each eye.

For 2 meter-angle 8° base in, part in each eye.

For 3 meter-angle 12° base in, part in each eye.

For 4 meter-angle 16° base in, part in each eye.

For 5 meter-angle 20° base in, part in each eye.

One meter-angle is 40 inches.

Two meter-angle is 20 inches.

Three meter-angle is 13 inches.

Four meter-angle is 10 inches.

Five meter-angle is 8 inches.

EYE INSTRUMENTS AND MACHINES.

Saving the Ophthalmoscope the Remainder Are Valuable Only to Bluffers.

The ophthalmoscope is easily the most important objective instrument used in examinations of cases, but few realize the fact as is proved by the manner in which they use it. The indirect method of observation consists of throwing light into the eye from a point ten or twelve inches away and interposing a strong + sphere; this may be imposing in appearance but it is mostly humbug on the part of the operator because he can not hold all the points necessary to be in line to see anything of the retina and when he is able to do it he only gets an inverted aerial image. If one insists upon that method he should get one of my instruments. Fig. 71, because it keeps all points in line and gives the best results possible indirectly. It is comparatively inexpensive, is portable, weighs only seven pounds and is lighted directly instead of by mirrors.

The best method is the direct one, because the operator sees the retina instead of its picture, and sees it upright instead of reversed, besides the facilities it affords for exploring parts not possible by the indirect method. The Loring, nineteen-lens instrument, Fig. 72, is the best because it is simplest. It comprises in one disk fifteen lenses, from 1. D.

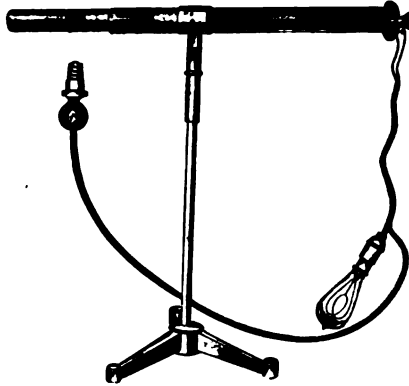


Fig. 71

to 7. D. + and from 1. D. to 8. D. —; then a second disk carries four lenses +.50 and +16. D. and —.50 and —16 D. If more than the highest number in the lower disk is wanted turn on the 16. D., + or —, then rotate the under disk until the desired number shows. A + 16. on + 7. would register + 23. of course, but by rotating the lower disk the + 7. is displaced and — 8. is combined with the + 16. giving + 8., then further rotation brings it on up to + 16. and still more turning add + 1., 2., 3., etc., up to 23. D. again. The — works in the same manner, up to 24. D.

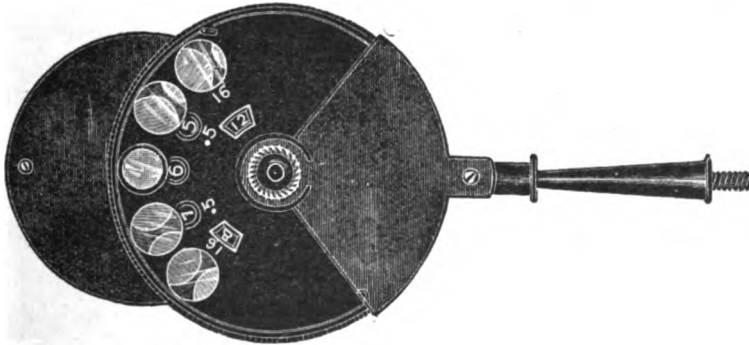


Fig. 72

Books on the use of the ophthalmoscope are misleading in two important directions: First, many of them convey the idea, either directly or indirectly, that the authors measure errors of refraction with it, which is an impossibility, because not only the patient but the operator would have to be atropized so thoroughly that neither could work the accommodation, and were that possible, the skill required to get the same focus

on the vertical and horizontal vessels, the vertical being much larger, would be impossible of attainment; hence such claims are either foolish or deliberate lies. Second, they illustrate diseases and alleged diseases and the student abandons the instrument because he finds nothing to correspond with the pictures. The real value of the ophthalmoscope lies in the facility it affords for the study of the quality and quantity of the blood in every case. It is of little value to the oculist because he is strictly an eye doctor, and has no idea of the relation of the eyes to general ills. When the general practitioner learns what he should there will be nothing left for the oculist or optician, while the neurologist will always be in demand because of his drugless creed and general utility.

The things to learn about ophthalmoscopic practice are: First, how to place the patient; second, how to get the best view of the fundus; third, what are the variety of appearances of the normal retina; fourth how to differentiate between physiological freaks and true pathological conditions; fifth, the relation between exhibits and causes; sixth, what to do for them.

The patient should be seated comfortably and look straight ahead. The optic disk is always the chief objective point and as it is located about fifteen degrees from the posterior pole, on the nasal side, the operator must throw light into the pupil from a point about the same distance on the temporal side; the light, if a mirror without electric attachment is used, should be about two feet behind the patient and far enough on the side so that it will shine past the edge of the orbit to the mirror, leaving the eye in the shadow. If the luminous instrument is used it is easier to get light into the eye, but, on account of an awkward crook in the handle to make room for the small electric globe, it is not so convenient in making wide explorations. The light, the patient and the operator must be on the same plane, which may be either horizontal or oblique; if oblique, and the operator is shorter than the patient, the light must be higher; if he is taller than the patient, the light must be lower; if on a level, the light must correspond. If the first attempt fails to give a good view, try again. A good guide is to imagine the patient has two eyes in the back of his head, and if looking into the right, aim so the light would pass through the middle head and out through the imaginary right eye on the opposite side of the head. If the blood-vessels are seen, but not clearly, twist the handle of the instrument a trifle so as to change the direction of the light; if the disk and vessels are seen, but dimly, turn on — spheres to offset the operator's accommodation. Unless the operator has much astigmatism it is best to work without glasses because the need can be supplied from the battery of lenses in the instrument. Learn to use either eye, allowing the other to remain open. Do not twist the neck;

sit erect, except that it is necessary to lean forward slightly. The back of the operator's chair should be even with the front of that occupied by the patient. A piano stool or other adjustable chair is convenient.

Fig. 73 shows an average normal retina, except that the veins, the darkest lines, are a little too dark; there should be a faint light streak in them, as shown in the arteries, represented by the lighter lines, which are a trifle too light. The white spot in the center is the optic disk, or blind spot, where the retinal arteries and nerves enter and the veins leave

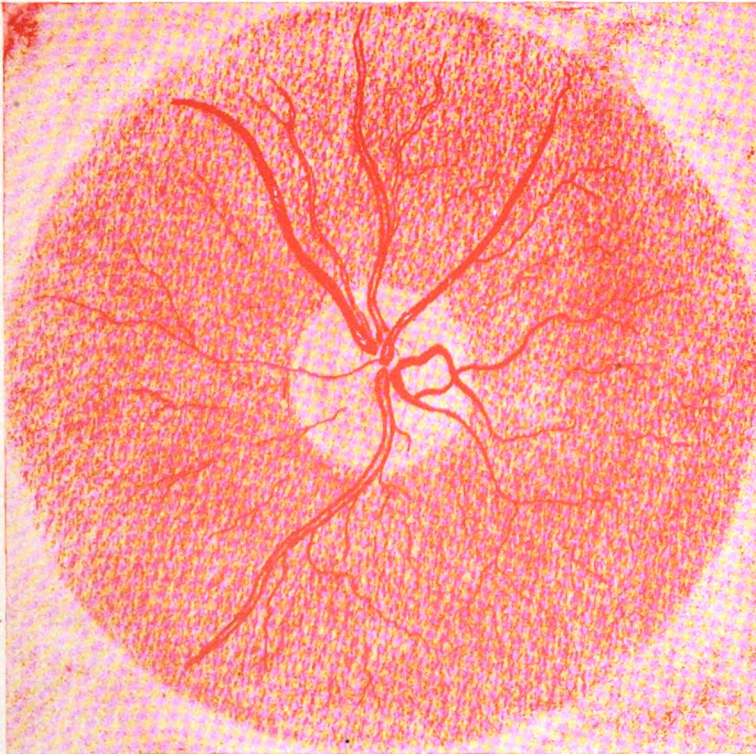


Fig. 73

the globe; the solid field shows the capillary system, which, combined with the nerve branches by delicate connective tissue, constitute the retina which extends from the edge of the disk forward to the edge of the ciliary body. The vessels should be of regular sizes, gradually smaller toward the periphery as they divide into branches. The currents of the arteries are from the disk and those of the veins toward it. Examination of a dozen or two pairs of eyes of healthy persons will give the student a better idea of what the average condition is than a whole volume of pictures could do. He will discover that in healthy children the contents of the arteries and veins is so nearly the same color that it would

be difficult to distinguish them were it not for the extra size of the veins; while in youth and middle age the difference is marked, and in old people quite decidedly so, partly because of diminution in the arterial supply and partly because of lack of tension in the walls of vessels which permits them to flatten under the pressure of the vitreous humor against them. In brunettes the blood is usually darker than in blondes. There may be



Fig. 74

deposits of pigment partly or all around the edge of the disk; or there may be great patches of pigment or even a deposit as white and shiny as the sclerotic, without inflammation, interference with the vascular system, or diminution of vision. The number of visible vessels varies from six to as high as thirteen. The vessels may not come so near to each other in the center of the disk as shown in Fig. 73 and some may disappear at the edge of the disk as shown in Fig. 74. These appearances are caused by a cupping of the disk and have no particular significance. Fig. 74 was drawn from an eye alleged to be glaucomatous, but $+ 2.50$ lenses removed all the other symptoms and the patient is still happy after nine years. The fairy stories about glaucoma, its causes and cures, are enough to make angels weep. One writer declared he caused it in one week with atropine and cured it the next week with eserine. A reputable ophthalmic paper printed the story too.

In myopia the vessels often turn abruptly toward the nasal side of the disk before disappearing and at the temporal edge of the disk is a

white crescent, caused by partial detachment of the retina and choroid, showing the sclerotic; this suggests the possibility of progressive myopia and should be watched.

In high amounts of hyperopia the disk is often very small and the vessels correspondingly insignificant; vision is usually poor and chances of improvement slight.

If there are several diopters of astigmatism the disk may appear blurred in one meridian but clear in the opposite one, when turning the lenses of the instrument will reverse the appearance.

Retinitis begins at the edge of the disk so far as appearance goes and is sometimes so intense as to obscure the edge as shown in Fig. 75, which also shows the choking of the vessels often associated with dysmenorrhoea. In ordinary cases, such as albuminuria, there is inflammation without the choking. Vision is usually affected and light is painful. Occasionally there is retinitis with a center independent of the disk, caused by pressure from an obstruction in the choroidal vessels behind, when there will always be a little blood-clot marking the point of pressure.

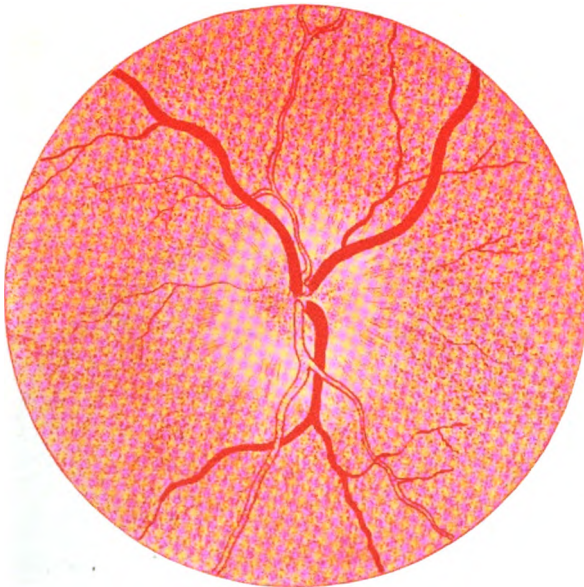


Fig. 75

In advanced stages of Bright's disease there will be found, in addition to the diffuse inflammation, first small pus-patches followed by a dry, white appearance (Fig. 76), which in turn is succeeded by black patches (Fig. 77), due to disintegration of retinal tissue exposing the pigment; in the last stage all three exhibits are present.

In syphilitic retinal affections there are black fantastic figures, like

spider webs, fern leaves or ink splashes, with no inflammation unless there chances to be kidney trouble, which is rare.

Wart-like dilations on the sides of vessels are tumors of the walls,



Fig. 76

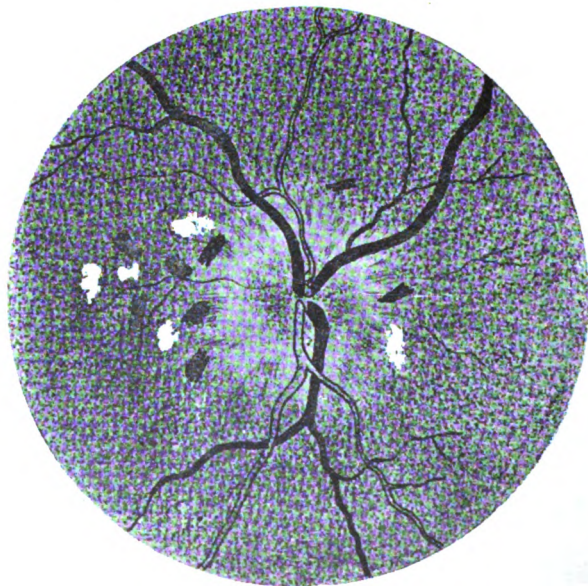


Fig. 77

sometimes found in persons excessively fat and correspondingly weak; they are called aneurysms and are dangerous because if in the eyes they are elsewhere, and the danger from hemorrhage is great.

Obstructions in vessels show congestion as in Fig. 78. Pressure is liable to rupture the vessels when the extravasated blood would spread out and coagulate, at least temporarily destroying vision. In time, however, reabsorption may occur and vision be restored.

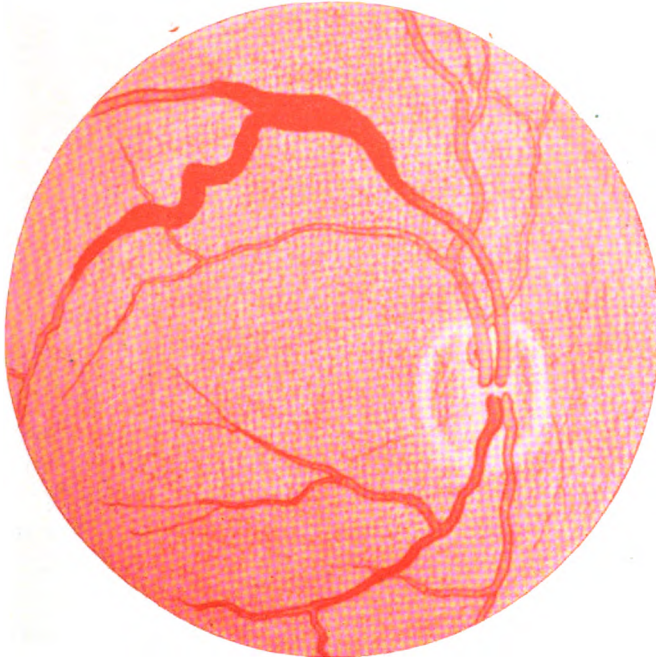


Fig. 78

In diabetic conditions the retina presents no inflammation, but a decided dappled or greenish-black streaked appearance; the patient will complain of floating particles in the visual field and will confess to a negative diet. Floating specks are also seen by cases of general debility from age or chronic neurasthenia and anaemia.

In chlorosis, although the cheeks may be rosy, the internal view discloses pale arteries and dark veins, with a lack of quantity in both. Such cases complain of general tired feelings and confess to attacks of faintness.

Dark arterial blood means the liver is not working, and even when the arteries are pretty good color, if the veins are unusually dark, look for a coated tongue.

Be sure to look for the "yellow spot of Soemmering," in every case. If you find it, I am a liar. If you don't find it, Soemmering and his tribe are. The posterior pole has a field around it upon which images must

be formed to be seen clearly, but there is no more color to it than there is to any of the other parts. It is more free from large vessels, but there is no other distinguishing feature. Some other German professor should come along and tell us he sees the pole.

Do not take anyone's word for anything except where it is exclusively a matter of veracity—and go slow on that. Learn by practice what constitutes a normal retina, and when there is departure, you will know it without pictures as guides.

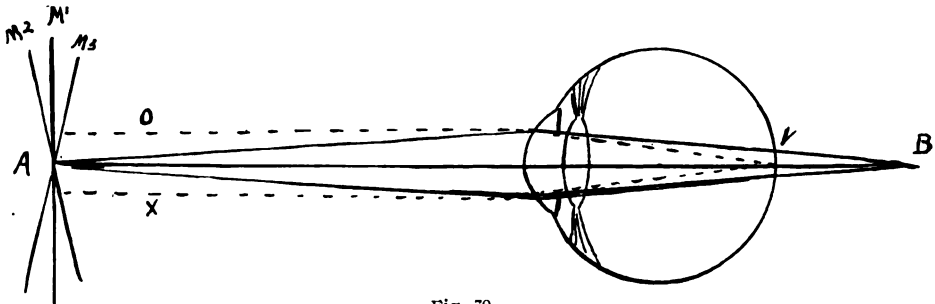


Fig. 79

Retinoscopy, skiascopy, skiametry, pupiloscopy, koroscopy, and the shadow test, are synonymous. It is an objective method. While they work well on schematic eyes, which are fixed dioptric systems, it is a physiological impossibility for them to be used with any degree of accuracy in fitting glasses, because the intense light thrown in the eyes sets the accommodation and iris to work at once, the pupil becomes smaller and the dioptric system is changed decidedly, decreasing hyperopia, increasing myopia and making emmetropia myopia.

Fig. 79 will be of service in explaining the action of the principle. The three lines crossing the axis at A represent three positions of the mirror. Fig. 80 is a mirror, it being in this instance a plane one. The



Fig. 80

light being reflected from the mirror M^1 at A Fig. 79 would focus at B if it could get there, but as the retina is in the way there are circles of diffusion formed at V and the light comes back from those circles over the lines upon which it entered, also along the dotted lines O and X and in all the space between them, so that the entire pupil is illuminated. By tilting the mirror back to M^2 the dotted line O becomes the line V A, and the original line, with all the rest, drops below the axis at the peep-hole so the only illumination comes from the upper part of the pupil, the rest being in eclipse—this is the shadow that follows the movement of the mirror in hyperopia, emmetropia and myopia of less amount than the equivalent of the working distance. If the

mirror be tilted to the position M^3 the line X will become the line B A, and all the rest will be above the axis at the peep-hole. The + lens which will bring the dotted lines down the black lines' course to A is the measure of the defect plus the working distance. The light may be thrown across the pupil vertically, horizontally or obliquely, and if the shadow moves with the operator's movement of the mirror + lenses will be required. If too much is put on it will cause the movement of the shadow to be against the mirror movement because the rays O and X will cross before they reach the peep-hole.

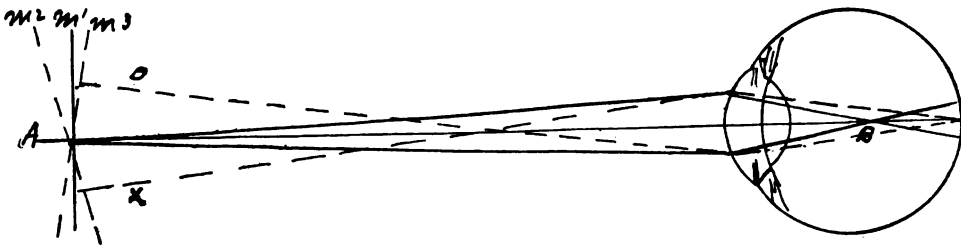


Fig. 81

Fig. 81 shows how the same mirror works on highly myopic eyes. The rays reflected from the mirror M^1 at A focus at B, and form circles of diffusion at the retina. The rays return along the black lines, the dotted lines, and from all the space between the black lines at the retina to all space between the dotted lines at the mirror. Tilting the mirror to M^2 raises the illuminated field at the retina and lowers the field at the mirror so that the ray O falls into the peep-hole while the rest drop below, but as this ray comes from the lower part of the pupil, which is the illuminated portion, the shadow movement is against the mirror. Tilt the mirror to M^3 and all the rays returning to the mirror will rise and X will fall into the peep-hole, the shadow will move up as the light is turned downward at the eye. The — lens which will cause the dotted lines to diverge until they only meet at the peep-hole will be the correction, minus the working distance. After finding the lens which stops the shadow, or in other words brings the observed retina in conjugate focus with the observer's, if the lenses are + they must be reduced the equivalent of the working distance and if — they must be increased that amount. That is, if the working distance is 20 inches the + lenses will be 2.00 D. too strong, and the — lenses will be 2.00 D. too weak. If the + lenses are less than 2.00 D. the eye is myopic the amount of the difference between the power of the lens and 2.00. Or, again, after getting the correction, + or —, hold a — sphere equal to the working distance, in front of the lens or combination, to give good distant vision.

If the concave mirror is used the effects will be reversed, the shadow will move against the mirror movement in hyperopia, emmetropia and in

myopia less than the working distance. Fig. 82 will give a pretty clear idea of how the light gets into and out of the eye by this method. It is decidedly more complicated than with the plane mirror, but the result is the same because it is the light coming out that the operator has to deal with. Rays from the light L, to the mirror are reflected to the point I where an image is formed which becomes the real light so far as the eye

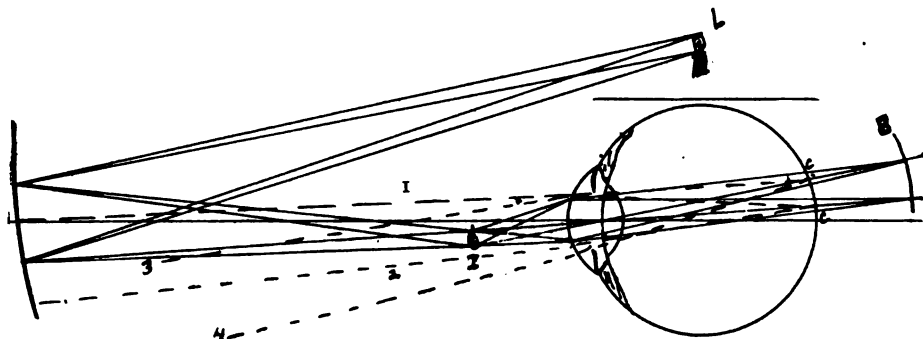


Fig. 82

is concerned, the rays from which would focus at B, if they could get there, but they form circles of diffusion from C to C and the light is reflected as shown from lower C along the dotted lines 1-2, and from upper C along the dotted lines 3-4. It will be seen that with the light I below the axis the circles of diffusion between C-C will be above the axis and all the light that strikes the peep-hole in the mirror must come from the vicinity of lower C and follow dotted lines 1 and 3 and all in the space between. Turning the mirror so that the light I is above the axis will put the circles C-C below and the rays from C-C at their new position will follow the dotted lines 2 and 4 and all in the space between as they are raised toward the peep-hole. Of course the shadow is on the opposite side; and as shown in the cut, the shadow comes up as the mirror is turned down.

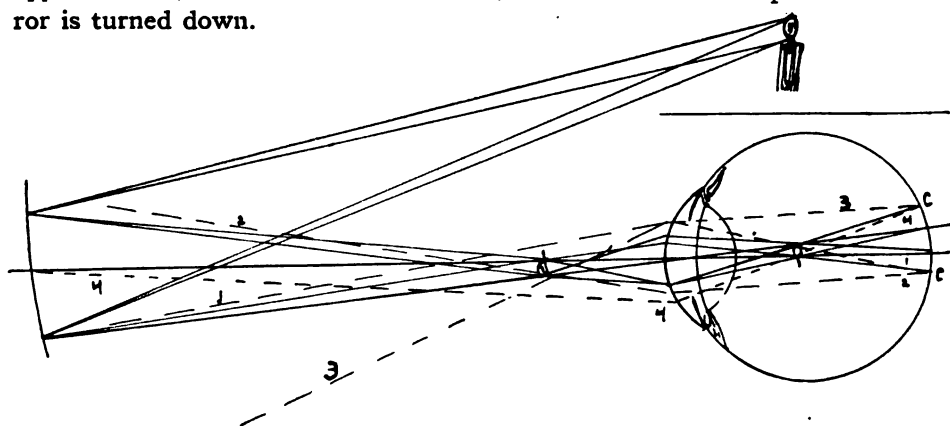


Fig. 83

If the eye is highly myopic a new feature presents itself. The

mirror forms an image in front of the eye, the dioptric system forms an image of the first one, which has become the real light to it, then the rays pass back to the retina and form circles between C-C. (Fig. 83.) The dotted lines 1-2 and 3-4 show the course of the emergent rays. In the position shown the mirror is throwing the light just below the axis and the image in the eye is just above the axis; the light that gets in the peep-hole follows the line 4-4', hence the illumination is below and the shadow moves with the mirror movement. Turn the mirror up so it forms the image above the axis, the one in the eye will be below, the circles will drop down and the illumination will follow the line 1-1' which will then be in the same position above the axis that 4 is below, as shown in cut, thus the illumination will come from the upper part of the pupil and the shadow follow from below, with the mirror movement.

I have given space to this story because it has never been told in detail before. As a means of measuring errors of refraction retinoscopy is worthless on account of the physiological obstacles mentioned in the beginning. When anyone says he can fit eyes by the method he is a humbug, and the worst of it is, he humbugs himself.

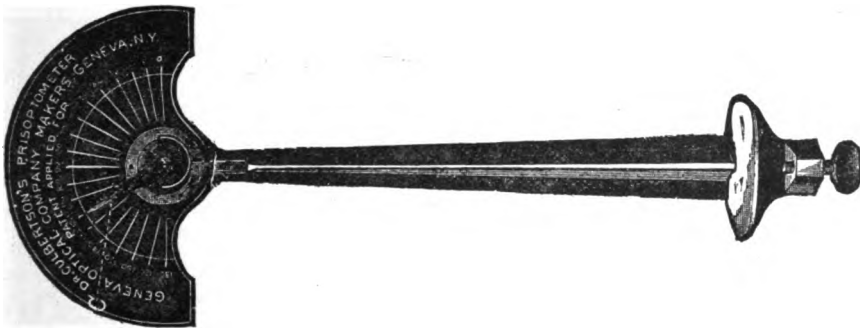


Fig. 84

The prisoptometer, Fig. 84, is a subjective method of attempting to measure errors, but it is very unreliable, for two reasons: First, the operator is compelled to rely on what the patient tells him, with reference to the targets; second, the test is a monocular one and there is a constant tendency to induce rather than suspend accommodation.

The ophthalmometer, Fig. 85, is an objective test and is an imposing appearing instrument to those who are in awe of apparatus, but it attempts a geometric impossibility in its principle, proposing, with a fixed spherical curvature in itself, to measure a variety of spherical and ellipsoidal curvatures in others. Its makers only claim it will register the axis exactly and approximate the amount of astigmatism. When one considers the fact that oblique astigmatism is sometimes exhibited by spasm or exhaustion of the nerve supply to the oblique muscles; that approximates to the amounts of astigmatism are not what a good doctor is looking for; that all work done by it has to be done over by subjective

methods; that it is expensive and that it is monocular, the conclusion is reached quickly that the price of it would be better employed in some other manner.

The stigmatometer is both an objective and subjective instrument, it embodies many excellent physical principles, and is a compliment to its young inventor. The only faults I find with it are: First, it is monocular; second, it is expensive; third, it is not practical for many of

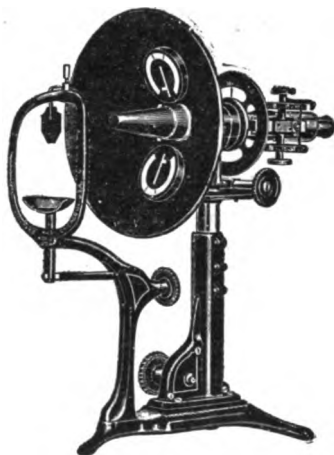


Fig. 85

the same reasons other machines are not. It may do for opticians or oculists, but neurologists and ophthalmologists, who are worthy of the name, have no use for such things, as they take valuable time that can be devoted to more effective methods which only cost money as education is paid for.

Phorometers, optometers, refractometers, and all similar devices are worth more to the makers and sellers than to anyone else.

The perimeter is all right in a school room or for experimental purposes, but in the doctor's office it is of less value than a retinoscope.

A good platform scale is worth more than a cart-load of the instruments enumerated after the ophthalmoscope, which is really a necessity.

According to various "authorities" to sleep is a waste of time, to eat is foolish, to work is a crime, to live is to worry and to die is hell.

When you learn that diseases of the kidneys have increased 24 per cent in ten years, maybe you will be a little more careful about what you eat and drink, and how, and when and where.

Please note that the death rate, from consumption, in this country decreased over 20 per cent in the last ten years. Then when some "cure" makes the claim in future that it did it, just class it with such humbugs as vaccination.

ABOUT ALLEGED DISEASES.

Old School Methods Compared With the New Drugless System.

There can be no greater proof of the humbuggery of the old school medicine than is found in an expose of their methods as detailed by authorities. If any dare challenge the accuracy of the following, all that is necessary to settle the matter is to write me for a list of the aforesaid. It will be observed by the intelligent reader that they do not mention causes, but proceed to treat the exhibits on the general "scientific" principle that if the doctor does not get results the first attempt he has the license to proceed on down the line. If patient survives the experiment nothing out of the extraordinary will kill him.

Abortion: Tincture opium in starch water, by rectum.

Acidity of the stomach (also called pyrosis; also heartburn): Carbolic acid, hydrogen sulphide, bicarbonate of soda, alkalies, ammonia, atropine, bismuth, calcium carbonate, charcoal, lime water, potassium, magnesium, mercury, nux vomica, silver nitrate and oxide, sodium, tannic acid and many others.

Acne or Acne Rosacea (Pimples): Alkalies, arsenic, belladonna, berberis, bismuth, borax, boracic acid, calcium sulphide, carbolic acid, cod-liver oil, hydrastis, mercury, nitric acid, phosphorus, potassium, quinine, sodium bicarbonate, strontium, iodine, sulphur, zinc, salts and patent medicines.

Actinomycosis (An inflammatory pus-forming condition found in the jaws and elsewhere): Iodine, potassium iodide, sodium salicylate, etc., by injection into the affected spot or by mouth.

Addison's Disease (Tuberculosis of the supra-renal capsules): Arsenic, cod-liver oil, creosote, glycerine, iron, nux vomica, opium, phosphorus, extract from other supra-renal capsules, hypophosphites.

Adenitis (Inflammation of a gland): Calcium phos., calcium sulph., carbon disulph., cod-liver oil, iron, and patents.

Adynamia (Loss of vital power): Arsenic, alcohol, acids, calcium phos., caffeine, camphor, hydrastine, iron preparations, nux vomica, phosphorus, quinine, oil turpentine, valerian.

Albumenuria (Nephritis, Bright's Disease): Gallic acid, aconite, alcohol, alkaline diuretics, mercury chloride, acetate of ammonium, arsenic, amyl nitrate, belladonna, caffeine, calcium, cod-liver oil, copaiba, croton oil, elaterium, eucalyptus, fuchsine, gold trichloride, sodium chloride, hydrastis, hyoscyamus, iron, jaborandi, juniper oil, lead, lithium bromide or citrate, nitroglycerine, nitrous ether, oxygen, pilocarpine, potassium, sodium arsenate, strontium, acetate, tartrates, turpentine, etc.

Amaurosis or Amblyopia (Impaired vision): Amyl nitrite, antipyrine, arnica, calomel, digitalis, electricity, emmenagogues if menstrual

difficulties are present, mercury, operation on muscles, nux vomica, pilocarpine, potassium, strychnine, veratrine, and many patents.

Amenorrhoea (Absence of menses): Acids, aconite, alcohol, aloes, ammonia, arsenic, asafoetida, cantharides, cimicifuga, colocynth, cotton root bark, croton oil, electricity, ergot, eupatorium, iron, phosphorus, manganese, myrrh, nux vomica, pennyroyal, potassium, quinine, sodium, savin, rue, silver nitrate, tansy, sitz baths, curettements, etc.

Anaemia (Deficiency of blood): Acids, alkalies, aloes, arsenic, bitters, calcium, calomel, copper arsenite, ferropyrine, hypophosphites, iron, manganese, mercury bichloride, nux vomica, oxygen, pancreatin, phosphorus, quinine, sodium, strychnine, wines and liquors.

Angina Pectoris (Strangle heart): Aconite, amyl nitrite, antipyrine, arsenic, atropine, cactus grandiflora, chamomile, chloral, chloroform, cocaine, convallaria, digitalis, ether, morphine, sodium nitrites, potassium, oxygen, phosphorus, bromides, quinine, strophanthus, strychnine, turpentine.

Anorexia (Lack of appetite): Hydrochloric acid, berberis, calomel, capsicum, china phila., cinchona, gentian, nux vomica, quassia, strychnine.

Aphthae (Sore mouth): Boric acid, carbolic acid, hydrochloric acid, nitric acid, salicylic acid, sulphurous acid, tannic acid, alum, bismuth, chlorine, copper sulphate, creosote, formaldehyde, glycerine, mercury, potassium chlorate or iodide, quinine, rhubarb, nitrate of silver, sodium.

Asthma or Emphysema (Periodical attacks of difficult breathing): Acids, aconite, adrenalin, alcohol, alkalies, alum, ammonia vapor, amyl nitrite, antimony, apomorphine, arsenic, asafoetida, belladonna, bromides, caffeine, camphor, cannabis indica, chloral hydrate, chloroform, cocaine, coffee, colchicum, creosote, duboisine, ether, electricity, gelsemium, grindelia, hyocine, iodine, ipecac, lobelia, menthol, mercury, morphine, nux vomica, eucalyptus oil, amber oil, opium, oxygen, pepsin, physostigma, pilocarpine, potassium bromide, iodide or cyanide or nitrite or nitrate, quinine, resorcin, sodium in all its forms, stramonium, strychnia, sulphur and tobacco.

Backache (Lumbago): Actanilid, carbolic acid, salicylic acid, aconite, antipyrine, atropine, camphor, capsicum, chloroform, cimicifuga, cod-liver oil, electricity, massage, mustard plaster, oil wintergreen, opium, phenacetin, pitch plaster, potassium, quinine, rhus tox, sodium, turpentine, veratrum.

Bed-wetting (Enuresis): Camphoric acid, ammonium acetate or citrate, antipyrine, atropine, buchu, cantharides, chloral hydrate, collodion, ergot, iron iodine, juniper, potassium all forms, quinine, rhus aromatica, rhus toxicodendron, sodium arsenat, spirits nitrous ether, strychnine, oil of turpentine.

Biliousness (Liver disorder): Acids, aconite, alkalies, aloes, ammon-

ium chloride or iodide, bromides, chloral hydrates, calomel, colocynth, hydrastis, ipecac, leptandra, manganese, iodide of mercury, yellow oxide of mercury, mustard plasters, opium, podophyllum, rhubarb, sodium phosphates or sulphates, stillingia, strychnine.

Bladder troubles: Benzoic acid, belladonna, buchu, cannabis indica, cantharides, capaiba, ergot, eucalyptol, gelsemium, hyoscyamus, stigmata mayas, potassium acetate, strychnine, electricity, nicotine, or patents.

Calculi, biliary, renal and vesical (Stones in gall-bladder, kidneys, etc.): Nitric acid, hydrochloric acid, anesthetics, belladonna, chloral, chloroform, iron, chlorine, mercury, morphine, oils, radium in all forms, ether, turpentine, alkalies, ammonium calumba, cotton root, ergot, lithium salts, magnesium, potassium, patents.

Caries or Necrosis (Decay of bones): Carbolic and phosphoric acids, calcium carbonate or chloride, cod-liver oil, gold, iodides, iodine, phosphorus, potassium, sarsaparilla, sulphuric acid, patents.

Catarrh (Inflammation with pus discharge): Acids, aconite, belladonna, ammonia, arsenic, bismuth, camphor, chloral, chloroform, cocaine, codeine, cubeb, eucalyptol, formaldehyde, ipecac, iodoform, jaborandi, menthol, nux vomica, oils, opium, pilocarpine, potassium, pulsatilla, quinine, resorcin, sanguinaria, silver nitrate, sodium, sugar, tartar emetic, veratrum viride, sulphate of zinc, patents.

Cerebral anaemia (Deficient blood in head): Ammonia, amyl nitrite, arsenic, caffeine, camphor, chloral, digitalis, electricity, euquinine, glonin, glycerine, gold, iron, nux vomica, phosphorus, quinine, zinc phosphate.

Cerebral congestion (Excess of blood in head): Hydrocyanic acid, aconite, arsenic, belladonna, bromides, cathartics, chloral, colchicum, colocynth, croton oil, digitalis, elateria, ergot, gelsemium, bromides, potassium, veratrum, patents and venesection..

Chlorosis (Anaemia from menstrual suppression): Acids, arsenic, iron, berberis, calcium, cocculus indicus, ergot, manganese, nux vomica, pancreatin, potassium, sodium, zinc, and all the other alleged remedies for anaemia from any cause.

Chorea (St. Vitus' Dance): Acetanilid, ammonia, amyl nitrite, antimony, antipyrine, apomorphine, arsenic, belladonna, bismuth, bromides, calcium, camphor, cannabis indica, chloral, chloroform, cimicifuga, cocaine hydrochlorate, cocculus, cod-liver oil, conium, copper, duboisine, ether, hyoscyamus, iodides, iron, lobelia, morphine, musk physostigma, picrotoxin, potassium, quinine, silver, sodium, stramonium, strychnine, valerian, veratrum, zinc in all forms.

Conjunctivitis (Inflammation of the eyes): Acids, adrenalin, alum, atropine, bismuth, blisters back of ears, cadmium, calomel, castor oil, cocaine, copper, eserine, formaldehyde, hydrastis, hamamelis, iron, mercury, opium, silver nitrate, sodium, tannin, zinc.

Constipation (Deficient action of bowels): Aloes, ammonium chloride, arsenic, belladonna, calomel, cascara sagrada, castor oil, chloral hydrate, cocculus, cod-liver oil, colocynth, croton oil, "dinner pills" composed of aloes and iron or with nux vomica, belladonna or hyoscyamus, ergot, eserine, frangula, gamboge, glycerine, guaic, hydrastis, ipecac, jolap, leptandrin, lime, licorice compound, magnesia, muscarine, manna, nux vomica, opium, ox-gall, physostigma, podophyllin, potassium, prunes, rhubarb, sodium, senna, soap, stillingia, strychnine, tobacco, turpentine oil, patents.

Debility (General weakness): Acids, alcohol, arsenic, berberis, bitters, calcium salts, cinchona, cod-liver oil, digitalis, eucalyptus, euquinine, malt extract, hydrastis, hypophosphites, manganese, morphine, nux vomica, potassium, quinine, sanguinaria, sarsaparilla, patents.

Diabetes insipidus and mellitus (Kidney trouble): Acids, acetanilid, alum, ammonium valerianate, antipyrine, arsenic, atropine, codeine, creosote, ergot, chloride of gold, iron, jaborandi, muscarine, opium, pilocarpine, potassium, supra-renal capsule, strychnia, valerian, zinc, alkalies, calcium, hydrogen dioxide, iodoform, quinine, rhubarb, sodium.

Dysmenorrhea (Difficult or painful menstruation): Acids, acetanilid, aconite, aloes, ammonium, amyl nitrite, antipyrine, arsenic, atropine, berberis, borax, cajuput oil, camphor, cannabis indica, chloral, chloroform, cimicifuga, codeine, copper, ergot, ether, gelsemium, ginger, guaiac, hamamelis, hydrastis, ipecac, iron, manganese, mercury, morphine, nux vomica, opium, picrotoxin, quinine, strychnine, viburnum.

Dyspepsia (Indigestion): Acids, alkalies, aloes, ammonium, arsenic, belladonna, berberis, bismuth, bitters, bryonia, calabar bean, calcium, calomel, calumba, cannabis indica, capsicum, cardomoms, cascara sagrada, castor oil, charcoal, chloral, chloroform, cinchona, cocaine, cod-liver oil, colchicum, creosote, eucalyptus, euquinine, gentian, ginger, gold, hops, hot and cold water, hydrastis, hydrogen peroxide, ipecac, iron, lime, magnesia, malt, morphine, nux vomica, opium, orexine, pancreatin, pepper, pepsin, picrotoxin, podophyllin, potassium, pyalin, quassia, rhubarb, sanguinaria, serpentaris, silver, sodium, stramonium bromide, strychnine, terebene, wahoo, xanthroxylum.

Eczema (A skin disease): Acetanilid, carbolic acid, ammonium, arsenic, belladonna, benzoin, bismuth, blisters, borax, calcium, camphor, cantharides, chloral, cinchona, cocaine, cod-liver oil, collodion, conium, copper, eucalyptus, hamamelis, iris, iron, jaborandi, lead, lime, mercury, menthol, nutgall, croton oil, phosphorus, phytolacca, potassium, rhus tox, silver nitrate, soap, sodium, arsenate, sulphur, tannin, tar, yolk of egg, zinc.

Epilepsy (Falling sickness): Acids, adonis vernalis, ammonium, amyl, nitrite, antipyrine, apomorphine, arsenic, asafoetida, belladonna,

bismuth, bromides, calcium, camphor, cannabis indica, chloral, chloroform, cod-liver oil, conium, copper, digitalis, duboisine, gold, hydrastis, hyoscyamus, ignatia, iron, lobelia, mercury, opium, phosphorus, physostigma, picrotoxin, potassium, quassia, quinine, rue, silver nitrate, sodium, stramonium, strychnia, supra-renal capsule, turpentine oil, valerian, zinc.

Flatulence (Intestinal bloating): Acids, alkalies, ammonia, asafoetida, belladonna, bismuth, calcium, calumbo, camphor, capsicum, charcoal, chloroform, creosote, ether, eucalyptus, ipecac, oils, manganese, mercury, muscarine, nux vomica, pepper, physostigma, picrotoxin, podophyllin, potassium, resorcin, rue, sodium, terebene, oil of turpentine, valerian.

Gastralgia (Pain in stomach): Same as dyspepsia.

Gastritis (Inflammation of stomach): Same as dyspepsia.

Headache: Acetanilid, acetic acid, hydrobromic acid, nitro-hydrochloric acid, phosphoric acid, salicylic acid, aconite, aloin, ammonia, antipyrine, arsenic, atropine, berberis, bismuth, bromides, bryonia, caffeine, cajuput oil, calomel, camphor, cannabis indica, capsicum, chloroform, cimicifuga, coffee, colchicum, croton oil, digitalis, ergot, ether, eucalyptus, gelsemium, heat, hydrastis, hyoscyamus, ice-bag, ignatia, magnesia, morphine, mustard, amyl nitrite, nitroglycerine, strychnia, phenacetine, picrotoxin, podophyllin, potassium, quinine, sanguinaria, sodium bicarbonate, bromide, phosphate or salicylate, strontium, tea, valerian.

Heart disease: Amyl nitrite, cocaine, digitalis, ergot, morphine, nitroglycerine, sodium, arsenic, cod-liver oil, cimicifuga, strophanthus, strychnine, aconite, bromides, electricity, potassium, veratrum, hydrocyanic acid, belladonna, camphor, lead, nux vomica, senega, ether, valerian, barium, iron, jalpa, veratrum.

Hysteria (Nervous excitement): Acetanilid, acids, aconite, alcohol, aloes, ammonia, amyl nitrite, antipyrine, apomorphine, arsenic, asafoetida, atropine, bromides, camphor, cannabis indica, chloral, chloroform, cimicifuga, cocaine, codeine, cod-liver oil, ergot, ether, eucalyptus, gold chloride, hyoscyamus, ignatia, iron, morphine, musk, nux vomica, oil amber, oil wormseed, opium, paraldehyde, phosphates, pulsatilla, tartar emetic, valerian, water, zinc.

Insomnia (Sleeplessness): Same as hysteria.

Intermittent fever: Same as hysteria, practically.

Leucorrhoea (White discharge from vagina due to weakness): Boric acid, carbolic acid, chromic acid, nitric acid, phosphoric acid, alkalies, aloes, alum, ammonium, arsenic, belladonna, bismuth, borax, catechu, copaiiba, copper, creosote, cubebs, ergot, glycerine, hamamelis, hematoxylon, hydrastis, iodine, iodoform, iron, lead salts, oil turpentine, potassium, tannin, zinc.

Liver troubles: Acids, aconite, ammonium, calomel, glycerine, io-

dides, iron, mercury, nux vomica, ox-gall, phosphorus, potassium, quinine, rhubarb, sodium phos., sulphur, teraxicum, oil turpentine, alkalies, colchicum, tartar emetic.

Metritis (Inflammation of womb): Carbolic acid, nitric acid, aconite, aloes, creosote, ergot, euquinine, gelsemium, gold and radium, chloride, iodine, iodoform, mercury bichloride, opium, potassium, silver nitrates, oil of turpentine, hydrastis, etc.

Nephritis (Inflammation of kidneys): Gallic acid, aconite, alcohol, alkalies, ammonia, amyl nitrite, arsenic, belladonna, broom, caffeine, calcium, calomel, cannabis indica, cantharides, chloral, cod-liver oil, copaiba, croton oil, digitalis, elaterium, ergot, eucalyptus, fuchsine, gadnol, glycerine, gold trichloride, hydrastis, hyoscyamus, iron, jaborandi, juniper oil, lead, lithium bromide, nitroglycerine, ether, oxygen, pilocarpine, potassium salts, sodium arsenat, tartrates, turpentine, water and patents galore.

Neuralgia (Nerve pain): Acetanilid, aconite, acids, alcohol, ammonia, amyl nitrite, antipyrine, arsenic, atropine, berberis, bismuth, bromides, cactus, caffeine, camphor, cannabis indica, cantharides, capsicum, chloral, chloroform, cimicifuga, cocaine, cod-liver oil, colchicum, conium, creosote, digitalis, dogwood, ergot, ether, eserine, eucalyptus, euquinine, gelsium, hyoscyamus, ignatia, iodides, mercury, morphine, nitroglycerine, nux vomica, croton oil, mustard oil, clove oil, peppermint oil, opium, phenacetin, phosphorus, potassium, pullsatilla, quinine, sodium, stramonium, turpentine, valerine, veratrum, zinc, patents.

Neurasthenia (Nervous debility): Arsenic, bromides, codeine, cocaine, euquinine, hypophosphites, iron, strychnia, phosphorus, potassium, zinc, aconite, ammonia, caffeine, camphor, chloral, chloroform, electricity, ergot, ether, ignatia, morphine, opium, pullsatilla, sodium bromide, supra-renal capsule, sweet spirits nitre, valerian.

Rheumatism: Acetanilid, acids, alkalies, alcohol, amber oil, ammonia in many forms, arnica, arsenic, atropine, blisters, bryonia, cactus, caffeine, cajuput oil, camphor, cannabis indica, capsicum, chaulmoogra oil, chloral hydrate, chloroform, cimicifuga, cocaine, cod-liver oil, colchicum, conium, creosote, digitalis, Dover's powders, dulcamara, eserine, eucalyptus, euquinine, Fowler's solution, gadnol, gelsemium, gold and radium, chloride, guaiac, ice, iodides, iodoform, iron, jaborandi, lithium in several forms, magnesia, menthol, mercury, morphine, mustard plasters, croton oil, turpentine oil, opium, phenactine, phytolacca, pilocarpine, potassium in a dozen forms, poultices, quinine, rhus tox, sodium, stramonium, sulphur, veratrum, valerian.

Tic douloureux (See neuralgia).

Torticollis (Wry neck): Acetanilid, aconite, arsenic, atropine, caps-

cum cimicifuga, opium, gelsemium, menthol, nux vomica, opium, potassium, strychnine.

Following is our method of procedure without drugs or surgery as commonly understood. The dollars appended indicate a fair price for our services. It is always to be understood that strict obedience to instructions is part of the fee. We recognize old names for convenience, but deny they are diseases.

Abortion. In prescribing glasses for highly nervous women during pregnancy, do not fog, lest the sudden relaxation which sometimes follows cause miscarriage.

Abcesses. Due to wrong diet and nerve strain. General treatment by dietary, etc., as described in another chapter. \$50.

Acidity of stomach. Due to foolish eating and nerve strain. One-half to a teaspoonful of dry salt with water enough to wash it down, for immediate relief. Then follow with general treatment. For the bloating of abdomen sometimes present, manipulate the intestines. \$100.

Albumenuria. Due to ignorant eating and drinking. Strict diet and general overhauling of machinery; rest. \$100.

Alcoholism. First our general treatment. If it fails, an asylum. It is a species of insanity that is highly dangerous.

Amenorrhoea. Absence of menses due to nervous derangements. General treatment to develop perfect nutrition. Manipulate limbs. Let the procreative organs alone. \$100.

Anaemia. Lack of blood due to malnutrition and nerve strain. General treatment with special attention to fresh air and breathing. \$100.

Angina Pectoris. (Strangle Heart.) Due to nerve strain from physiological causes. Regulate the nerve supply and distribution; rest. \$50.

Apthae. (Sore Mouth.) Due to nervous derangements affecting the liver. General treatment; salt, dry in the mouth as local help to remove the soreness as the cause of inconvenience. \$50.

Apoplexy. (Cerebral Hemorrhages.) General treatment, very strictly. \$100.

Asthma. (Affection of bronchi from nerve strain.) General treatment. \$100.

Appendicitis. (Stricture of bowels from neglect of nature's calls, and nerve strain.) Manual treatment with rectal injections of hot salt water to evacuate the colon; a tablespoonful of spirits turpentine to half gallon of water, if there is bloating. \$100.

Atrophy. (Wasting.) Applies mostly to nerves, but may describe dead tissue. May be arrested by general treatment, but damage done cannot be undone. \$50.

Biliousness. (Liver disorder due to overworking it with — foods.)

General treatment. Restrict to rest and fruit diet until the liver shows signs of being ready for work, then proceed to feed lightly \$50.

Bladder Troubles. These are always due to spasm or exhaustion of the nerve supply or to hypertrophy or atrophy of structure. Stick to general treatment and have patients avoid liquors and sexual excitement. Rest is imperative. \$100.

Bright's Disease. (See Albumenuria.) An acute form of albumenuria. If there are pus patches, white or black spots at the retina it is beyond the limit angle. Let the old school doctors have it. \$250.

Bronchitis. (Related to asthma; usually due to colds, however.) Strict confinement, hot baths and sweating with a very light but powerful fruit diet. Lemon juice in all water used for drinking. \$100.

Calculi. (Stones in liver, kidneys, etc.) Strict + diet and not much of it until the stones disappear. Absolute rest to avoid irritation. \$100 to \$500.

Catarrh (A meaningless word, used villainously.) All so-called catarrh, except of the nose, throat and ear, are humbug, as anyone may prove readily by following our general treatment. The nose, throat and ears being open, are exposed to foreign bodies, dust, etc.; they should be kept clean; the nose and throat particularly should be douched by snuffing and gargling strong salt water daily until all symptoms have disappeared, then the mouth should be so cleansed every morning and the nose at least twice a week, as the same causes will produce the same effects again. For the ears, let several drops of the salt solution run into the ears twice a day until suppuration and "ringing" ceases. Do not fear injury. The old doctor who tells you it will do damage is either a fool or a knave. \$200.

Chancre, and all other vile diseases, due to immorality or accident, send to our friends the old drug doctors. They are a great convenience and need the money.

Chlorosis. (Debility of girls from general nerve strain.) General treatment, lots of fresh air, stop all school work and close application. Watch lungs and mentality. Keep careful note of conditions of blood by ophthalmoscopic observation. \$250.

Cholera Morbus. (Poisoning due to overeating unripe fruit or vegetables.) Treat same as appendicitis. Give salt by mouth to relieve pains in stomach. \$25.

Chorea. (An exhibit of nervous irritation from constant excess demands. Known as St. Vitus' Dance.) Pay strict attention to diet and correction of the eyes. Stop close work and violent exercise. \$200.

Colic. See cholera morbus.

Conjunctivitis. See chapter on eye diseases (?)

Constipation. (Suspended action of the bowels, usually due to errors of refraction in the eyes and other excessive demands on the nerve supply

that interfere with the rhythmic motion of peristalsis, cause strictures in the sphincter muscles and interrupt the action of the digestive and assimilative machinery generally.) Begin at the eyes and work down, stopping all leaks or strains, regulate the diet, manipulate the abdomen, (often once is all that is necessary) and see that patient follows orders. \$200 to \$500.

Consumption. See tuberculosis.

Convulsions. These are emergency cases. They are, of course, due to shock or strain on the nervous system, but treatment depends on the cause. Usually it is best to give hot baths. After the spasm subsides a general examination will disclose the causes which, when known, are usually easily removed. \$100 to \$500.

Coryza. (Cold in head.) Pull neck.

Debility or Neurasthenia. A general breaking down of the system. If it comes to the very young it is due to congenital causes or malnutrition; when found in the youth or middle aged it is usually due to physiological or mental strain or both; in old people it is a natural wearing out of the machinery. The first class requires tender care because children do not know how to look after themselves; the second need watching or those who are in active life will violate orders as if they expected they could purchase health with money; the older ones usually follow instructions but results are more unsatisfactory than in the others who obey the doctor. \$200 to \$1,000.

Diabetes: A disorder of the blood caused by overworking the liver with — foods. In the first stage it exhibits by excessive secretion of urine, and in the more advanced stage, by a thickening of the fluid from the excess sugar which clogs the kidneys, causes uraemic poisoning and death. Strictly + foods until all symptoms disappear.

Diarrhoea. Absolute rest, salt water rectal injections, manual treatment of 12th dorsal vertebra and such food as blackberries in small quantities. Lemon juice in all drinking water. Seat patient on chair, put knee against lower dorsal vertebrae, pull back gently but firmly on shoulders for two minutes, then put to bed. \$10 to \$25.

Dysentery. See Diarrhoea.

Dysmenorrhoea. General treatment between menstrual periods. For the convulsions sometimes attending the menses, manual treatment, one hand on the sacral nerves and the other titilating the clitoris. This directs the entire nerve current locally to the uterus, starts the natural rhythmic action and utilizes the sexual instinct to good purpose. Our general methods afford permanent relief so quickly that it is rarely the pains return after the first month or two. \$150 to \$500.

Dyspepsia. (See Constipation.)

— Earache. For emergencies, a pledget of cotton in a goosequill with a

drop of chloroform; breathe gently in one end of the quill while the other is in the ear. This is merely a local anesthetic and is not treatment. While it is effective, instill warm water and wash ears, then a few drops of salt water and confinement for the day in even temperature. \$25.

Eczema. General treatment to get the machinery in working order, of course, but for the annoyance of the eruption apply coarse cloths kept soaked with cold salt water, two drachms to the pint. Keep on all day, wetting occasionally. It will hurt like blazes, but the good nights of rest which follow will be a reward and the permanent relief from the entire course of treatment makes grateful patients. \$50 to \$250.

Emissions. See Incontinence.

Emphysema. See Asthma.

Enuresis. (Bed-wetting.) See Epilepsy or Chorea.

Epilepsy. See Chorea, as both belong to the same class, practically. \$200 to \$500.

Epistaxis. (Nosebleed.) A good thing for stout people, as it has often prevented apoplexy. Reduce flesh by dieting and keep quiet until the walls of vessels get strong from the + food. \$25 to \$100.

Erysipelas. Butter-milk used as salt water is for eczema. General treatment for the causes. \$100 to \$500.

Fetid Breath, body or feet. Use salt water as for catarrh, bathe freely, especially the feet, and to keep the latter from getting too tender rinse them in salt water. General treatment. As long as feet are confined in shoes they will be fetid.

Fevers. Stop eating, drink lemon juice, diluted, to quench thirst, sweat and remain in bed. If bowels are bad, use salt water injections for antiseptic purposes.

Floating kidney. See Prolapsus.

Flatulence. See Constipation. \$25 to \$200.

Gall-stones. See Calculi.

Gastralgia. (Neuralgia of the Stomach.) A half teaspoonful of salt, repeated in fifteen minutes if pain does not cease. Stop eating and treat for acidity.

Gonorrhoea. (A venereal product exhibited in inflammation of the urethra and exudation of pus.) Stop liquors, all sexual excitement, diet, keep quiet, and let it alone. It is not proof of association with sporting women, but is acquired so frequently in such manner that it behooves husbands and wives to be temperate in their sexual relations if they would avoid possible doubt of each other's fidelity. \$100 to \$500.

Gout. A form of neuralgia resulting from excessive indulgence in club life, wines, etc. \$100 to \$500.

Headache. See Constipation. Pull neck.

Heart Disease. (There is no such thing. It is general nerve derange-

ment.) See debility. The old school doctors make a great ado over "tobacco heart" and "mitral valve disease." We laugh at such "diseases," but go after the real situation, which is serious sometimes.

Hemorrhoids. (Piles.) General treatment and rest. Get bowels clean and active, when piles disappear. \$100 to \$250.

Hiccough. Pull the neck; startle; feed pounded ice or ice cream, then adjust the nervous system by general treatment. \$50 to \$100.

Hydrocephalus. (Water on the brain.) Send to old school doctors or asylums.

Hypochondria. (Mental collapse from nerve shock or strain.) The worst condition we have to meet. Strict general treatment, isolate from too much sympathy, or an entire lack of it. Get the mentality aroused. \$200 to \$1,000.

Hysteria. (Mental and physiological spasm from nerve shock or strain.) A comparatively easy class of cases if patient can be controlled, and for the latter purpose should be treated much as hypochondria. The advantage in this instance is it is more hopeful. \$200 to \$1,000.

Impotence. (Loss of sexual ability.) General treatment; particularly restricting liquor, tobacco, etc. Absolute rest. \$250 to \$1,000.

Incontinence. This is the result of general weakness from long continued nerve strain, from injury or from excessive venery. It may affect only the bladder, but often involves the prostatic gland and nightly emissions. See debility.

Insomnia. Sleeplessness from nervous irritation. General treatment, light diet, rest and open air just before bedtime; pull the neck. \$100 to \$500.

Intussusception. A telescoping of the small intestines into the caecum. See appendicitis.

Iritis. See chapter on alleged eye diseases.

Kidney diseases. See albuminuria.

Leucocythemia. A blood disorder in which there are too many white corpuscles, indicating by the ophthalmoscope a nervous debility even before it affects the patient's endurance. See debility.

Leucorrhoea. A vaginal discharge due to nervous exhaustion and lack of observation of laws of cleanliness. After menstruating the vagina should be washed with hot soap-suds, rinsed with tepid salt water and douched once a day with the latter. General treatment to get system in perfect shape. See dysmenorrhoea.

Locomotor Ataxia. (Tabes Dorsalis.) Said to be a product of syphilis. No remedy has yet been found. We have some patients who stopped taking potassium iodide seven years ago and are in as good shape as they were then, by simply watching the diet. They are unable to perform any business duties, however.

Lumbago. This affliction of the loins, exhibiting by pains in the small-of-the-back, requires general treatment applied strictly, and sometimes manual treatments to adjust such vertebra as impinge on the nerves. Sometimes almost instant relief is thus rendered. \$50 to \$200.

Mania. See hysteria.

Melancholy. See hypochondria.

Menorrhagia. (Menstrual flooding.) Usually preceded by dysmenorrhoea. Manual treatment for the emergency is to grasp a wisp of hair around the vulva and give it a quick, short jerk. It will make the patient angry, but it gives results. Then follow with absolute quiet, lying down and a light but vigorous + diet. They are all right in a month as a rule. \$50 to \$200.

Mentritis and Endometritis. (Inflammation of the womb.) See menorrhagia for treatment, except manual, which is not needed.

Morning Sickness. The vomiting of pregnancy or from general debility. Neither should exist. See debility.

Myalgia. Literally means muscle pain, which is an impossibility. It might be called myo-neuralgia. Pull the neck and order general treatment. \$50 to \$100.

Nephritis. See Albuminuria.

Neuralgia. Nerve pain, which is, in fact, the only possible kind of pain. Is a frequent sequel to surgical operations, which must be taken into account in our analysis. Pull the neck and follow with general methods. \$100 to \$500.

Nymphomania. Sometimes called Priapism. Excessive sexual desire in females; its synonym applied to males is satyriasis. The simplest and most logical treatment would be the satisfaction of the desire ad nauseum, then mental education and general treatment. \$100 to \$500.

Obesity. (Too much fat.) Strict diet. \$50 to \$500.

Ophthalmia. See chapter on alleged eye diseases.

Orchitis. (Inflammation of the testicles. Rest and same procedure as for gonorrhoea.

Otitis and Otorrhoea. (Ear troubles.) See catarrh.

Ozoena. (Discharge from the nose.) See catarrh.

Paralysis. (Loss of nerve supply or derangement of distribution.) Absolute rest, general treatment; pull the neck.

Peritonitis. (Inflammation of the lining of the abdomen.) Requires absolute quiet and evacuation of the bowels, strict diet and general methods.

Pneumonia. Inflammation of lungs. Pull neck and keep cold salt-water cloths on chest.

Prolapsus. (Falling.) Refers to uterus, anus and kidneys. Treat same as debility. \$100 to \$500.

Prostatitis. See gonorrhoea.

Prostatorrhoea. See gonorrhoea.

Prurigo. (Also called psoriasis.) Itch. See eczema and erysipelas.

Pyrosis. See acidity.

Renal diseases. See albuminura and diabetes.

Rheumatism. A fool word meaning rhubarbism, used to denominate certain forms of neuralgia. There are two kinds: musculo-motor and vasculo-motor; the first is restricted to the arms, legs and neck; is painful and can be reached by neck pulling and manual handling of the limbs, rotating and assisting to relieve the pressure which certainly exists; the second involves the circulation of the blood and lymphatic systems and causes swelling as well as acute pains; general treatment alone is all that will be tolerated. Let the old schools have it. \$100 to \$500.

Sciatica. See Rheumatism.

Scrofula. See Tuberculosis.

Skin Diseases. Symptoms of general nerve derangements and blood disorders. Treat generally. See eczema and erysipelas.

Tetanus. Pull neck.

Tinnitus Aurum. (Roaring in ears.) See catarrh.

Uraemia. See Albuminuria.

Uric Acid. See gout.

Vertigo. See constipation.

Wounds. For fresh cuts immerse in spirits turpentine, then wrap in coarse muslin or linen cloth and keep well soaked.

Zymolysis. See acidity.

THE MATTER OF DIET.

A Couple of Hours With My Pupils in McCormick Neurological College.

In the institution named above the constant endeavor is to be brief and use simple language, so that none may fail to understand. The following are specimens of our method of teaching dietetics. There are many ways of telling the same truths, and when the subject has been treated from many standpoints and under different circumstances during the course, the students become very familiar with the essential principles, when the details take care of themselves as they arise.

ONE HOUR'S WORK.

After we have built our ideal man and denominated the functions of the various departments, we must remember that there are two possible situations: First, the influences over which we have no control; second, those which are within reach. Of the latter, the matter of sustaining vitality and avoiding over-taxation of the reserve supply of nervous energy are the greatest, in fact they are the whole thing.

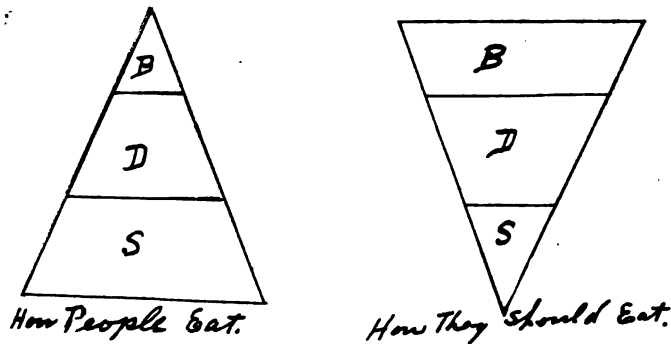


Fig. 86

The diagram above, Fig. 86, showing the diet as commonly practiced, with reference to quantity, and that which should be practiced, will attract interest, and when simple reasons are given, there is a better chance of being effective. B stands for breakfast, D for dinner, S for supper. All machinery works strictly in accordance with natural laws, and the machinery in man is no different from any other, except in being dominated by mentality, which has been perverted from the beginning of history, which is the principal proof if there is any, of the existence of a devil, and it follows logically that when he wants to take advantage of us he would naturally want to allay any suspicions we might have, hence he teaches that there is a God who will forgive any mental slips, and a mysterious doctor with mysterious drugs, who can perform miracles if we indulge physical appetites, thus violating law. Neurology teaches that he is a liar in both cases.

In the morning when the day's labor is about to begin, the machinery should be started gently by eating a little fruit, a drink of pure, cool water, then a little turn in the open air, avoiding hurry, getting up early enough so that from one-half to one hour elapses before breakfast. Of course the first essential is to go to bed on a comparatively empty stomach; and right here we have the first reason for inconvenience to our patients. In physics we have plus and minus lenses in which the prisms are exactly reversed and their effect upon light typifies exactly the effect of inverting habits.

A good breakfast, when the stomach is ready for it, not only starts the current of nervous energy, but creates an equal demand, hence, he gets an equal distribution. No one is liable to eat too much in the morning, hence he gets a natural example as to quantity. At noon he has a natural appetite and gratifies it with about the same quantity, and in the evening there is possibly an equal appetite, but he is given brains, a mind, with which to reason that there are two things which make a good supper unnecessary: First, he is about to enter upon a period of comparative rest; second, it is therefore necessary to supply only enough fuel to main-

tain the pressure for the light work. Man is slightly different from a boiler and engine, although theoretically the same, because, to get a good fire, combustion must be perfect to insure the chemical reactions, and in the stomach hydrochloric qualities need replenishing just as chemical batteries do, but after the chemicals are put in a reasonable time should elapse before they are asked to go to work if we want the best effects. This is principally what we use lemon juice for, and, being a natural food it may be continued indefinitely, without possible harm, just as the engineer closes his drafts and covers his fire at night without damage.

Of course the doctor must have brains as well as the patient, and if his patient is working nights he should have his big meal in the evening, a medium one at midnight, and a light one in the morning. Or, if a person who has worked all day is also going to work at night, he can eat more supper; but in that case he should eat only a light lunch at noon because in all cases, working or not working, the overloaded stomach fails in its duties.

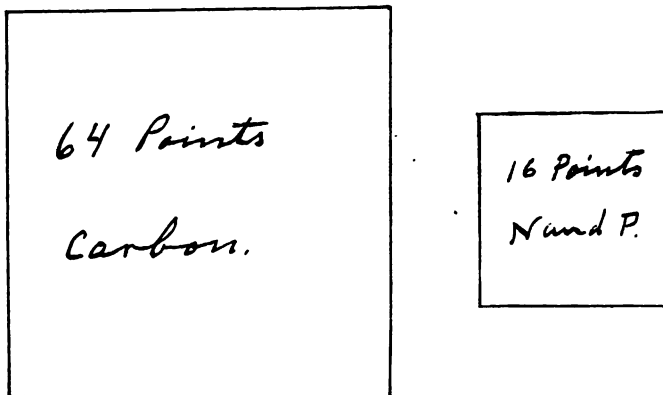


Fig. 87

The next thing to consider is the quality, and we have another diagram for that, Fig. 87 showing the old school proportions of carbon, to nitrates and phosphates.

The accepted authorities have taught for generations that the body needs three to four times as much carbon as it does nitrates and phosphates. Observation of the diet of our patients has shown that they naturally use a diet running in the proportion of two to one, but when under the treatment of old school methods they had to take care of a lot of drugs also, and when those failed, the chronics took up advertised foods which increased the proportion of carbon. While those who went to sanatoriums, such as Battle Creek, gained in weight and apparently in strength, it was only because they were resting from other labors and digested the food, which, having little else than carbon and water, could make little else than fat, and when they returned to their occupation they broke down quicker than before.

For such patients we reverse the order of things to at least the extent of a proportion of two N and P to one of C, and often more, for at least thirty days, often ninety days, and by that time the patient has learned enough so he rarely ever lets the carbon more than equal the other.

One of the remarkable but very natural results is that with the same diet, administered judiciously, the fat person reduces rapidly while the lean one increases in weight, slowly but surely, until he reaches his natural standard. The reason is that the material being denied the fat man, except sufficient to maintain his natural proportions, he has to come down to it, and while he is doing this the demands upon his circulatory and nervous systems are being diminished, while the elements necessary for the muscles and nerves are increased and the reserve is replenished rapidly. Here we have the explanation of why the stout person, with average duties and responsibilities to perform, is nervous and sick and is treated brutally because he appears so well he gets no sympathy.

On the other hand, the thin person who is sickly will always be found to have a greater combination of causes, needing a more careful analysis and treatment, more rest and more detailed explanation of his case in order to persuade him to follow instructions strictly. He certainly has no excess weight to carry and although he may be eating all the fattening foods the other did, and he usually is, he does not get fat because he does not digest it and assimilate it and he does not get strong because he is using more energy than he is creating. We put him upon the + diet, watch him carefully that he does not overload, because he is often inclined to, particularly at noon and evening, which is one of the reasons it didn't fatten him. We first supply the energy to fill the tank, after which the process of digestion and assimilation is more vigorous and will soon begin to show increased strength, although it will be some time before he begins to fatten.

The objection has been offered by thoughtless people that the doctor who instructs his patients so thoroughly will lose business in one of two ways, if not both. First his patient will go out and use the same treatment for others, thus beating the doctor out of just dues; or, second, he will try it and fail to succeed when he will declare that the method is no good because of said failure. We answer both at once: The dietary and other treatment, instructions for which are also given the patient, are not the only things. The chief essential is lacking, and only the doctor can supply it, which is the analysis of each case, that must always precede treatment. Hence only fools would accept treatment from laymen, and that is one of the ways in which the fool-killer operates.

The manner in which such bold people can do harm is that they delay securing skilful services in an effort to save a few dollars, until the final expense is more than double, because the neurologist charges for

the value of his services, which is measured by the benefits to his patients. Those who willfully delay rational treatments and experiment with patent medicines, diagnosis, operations, etc., are charged in proportion to the difficulties they have added to their cases.

While we are able to make and do make deliberate figures upon the principal articles of diet, there are many which have not been analyzed and so many that are used in such small quantities that it counts for little, if we have the following classification and remember the matter of quantity we cannot make mistakes.

Foods which grow underground entirely, like potatoes, peanuts, etc., and those which have the fruit upon the end of a hollow stalk like wheat, rice, etc., contain the most carbon, hence when eaten at all should be accompanied by fish, oysters, chicken, veal, mutton, ham or game, with fruits, such as apples, cranberries, gooseberries, strawberries, olives, figs, oranges, pineapples, tomatoes, etc., which are all highly nitrogenous and phosphatic.

Such vegetables as turnips, beets, radishes, celery, rhubarb, melons, cabbage, etc., are chiefly water, having a proportion of carbon and nitrates and phosphates of about two C to one N and P, but both in small quantities, not averaging over 6% in the aggregate.

Peas, beans, corn, etc., are in about a proportion of one to one.

Nuts are good food, because their oils are fattening, easily digested, and the nerve and muscle elements are in good proportion. The peculiar oil is such that too great quantities have reverse effects quicker than almost any other + food.

Milk, cheese and water are all good.

One of the essentials to success in dietary is variety and it is not advisable to give a patient more than two days' diet at a time, when he should return for dynamic and static tests and further instructions. In order to avoid an apparent sameness, if treating two cases in the same family, at different times, be sure to keep records and make such changes as will show that it is the doctor who is prescribing. If there are two cases in the family at once, it is all right to prescribe the same diet, explaining that it is done for convenience, and that the dietary, while an essential, is only so in a general way.

There is considerable difference in fruits, for unknown reasons, but experiment has shown that as a rule those with many seeds or compartments are superior to those with a single seed. For example, the cherry, with a tough, smooth skin like a grape, is not as good food as the grape, the latter being all right for almost everybody, provided they are washed before eaten. The sugar is chiefly upon the outside. Peaches are largely water, but having a rough seed and a quality peculiar to themselves, are better than pears, which have small seeds but are chiefly water.

A common fault seen in every home is that they eat soup first, and fruit and pastry last. A very palatable and excellent dinner of chicken, beans, corn and potatoes may have its effect entirely neutralized by adding the pastry which is eaten either for politeness or because it is attractive to the taste, and the natural result of such a combination is first, too great a quantity; second, the quality is destroyed. A proper arrangement would be to eat a little fruit first, then the soup, then the pastry, then the dinner, because the intense tasting foods cause the others to pall soon and we have thus stopped quantity and struck a pretty good average in quality.

For breakfast, ham, veal, mutton or chicken, with corn, peas or beans and tomatoes, may make a little more work, but having the boiled dinners, roasts, etc., at noon, the saving of work after supper by eating cold meats, green vegetables, like lettuce and sliced tomatoes, with cheese and other things easily prepared, revolutionizes house work, because even the dishes may be left and washed before breakfast in the morning. Put the dishes to soak in cold water in the evening and they will wash easily in the morning. In this way the dishes won't dry and wife who does her own work will have more time with the family in the evening, which is as it should be.

Cold meats are not palatable to some people, but are really better and if eaten with plenty of salt, cranberries, apple sauce or stewed fruits, jams, jellies, etc., together with observing the other details of diet and hygiene, the appetite feature is soon changed because the system is in such shape that any thing tastes good.

It is against our principles to force patients to eat when not hungry. It is our business to create an appetite, and while doing it the meals are liable to be a little irregular, especially for children, and we advise keeping fruit convenient, particularly apples and oranges, with berries in season, so that if the patient is hungry at bedtime, or awakes hungry in the night, a few bites of fruit and a cracker may be eaten without harm.

If a patient has been under medical treatment and has taken medicine within forty-eight hours, we do not begin dieting except as to quantity, until another day has passed.

We do not starve anyone; that is, even in the most rigid cases, we do not allow the pangs of hunger to annoy. Often those who have been voracious eaters will insist that they cannot live on what we prescribe for the first few days, but in three weeks will volunteer the information that they never before realized what a comfort the stomach could be, a common expression being, "I really don't want the extra food I used to eat."

In treating males who smoke or chew, we do not permit it after

supper, while under our instructions; while bad tastes in the mouth come from bad teeth or deranged liver, our dietary will ascertain which, if not interfered with by tobacco, candy, etc., eaten after supper. The last named applies chiefly to children and women.

ANOTHER HOUR.

When I assert that by our system of dietetics we can take off excess fat or increase the weight of lean people with the same articles of food, some readers will be disposed to doubt my sanity or my veracity. But I only ask a hearing and a trial to convince the most skeptical. There are so many fads in food that half of the population of America is devoted to one or another of them, while the other half ignores them all, and both classes are constantly reminded they have stomachs. The last named are the most tolerable because they are not everlastingly worrying others with their troubles, as those comprising the first class do. The reason they are faddists is because not one of all their many so-called systems has the least scientific basis.

The first essential of a dietary system is an understanding of the chemistry of the body; the second is the chemistry of food; the third is the quantity to eat; the fifth is when not to eat; the sixth is how to eat.

The fourteen principal elements in the human body are oxygen, carbon, nitrogen, phosphorus, sulphur, chlorine, silicon, hydrogen, calcium, sodium, potassium, iron, fluorine and magnesium. The first eight are classed as acids and the other six as alkalies by the authorities, and are given the signs — for acids and + for alkalies.

Analysis of the body is one thing; analysis of food is another; the reactions of the fluids of the body on the food is a third; and the effects of the new combination on the body is a fourth proposition. The first tells us that what the body comprises it must have to sustain it; the second tells us the proportions of elements in foods, enabling us to select those which promise to supply what we find deficient; the third must, of necessity, be empirical, because the fluids of the body are exceedingly inconstant in their proportions, hence the need of a doctor who knows what exhibits mean, with reference to the reactions, and what to do when they are not normal; the fourth is like the third to a degree, because, for the same reasons, one not devoting his time to the study could not hope to choose a diet successfully.

In applying the signs + and — we ignore the chemical laws by which the signs are given to the fourteen elements named, because they become inoperative when we have added the second duality in the last paragraph above; also for the reason that it is intended to make the story as simple as possible.

The drug schools of medicine have no system of dietetics, except starvation and the old carbo-hydrate theory, because they have attempted

to supply the elements needed by way of their prescription cases, in order to earn a fee. Neurologists never write a prescription that cannot be filled in the family kitchen or at a grocery, and they feel that they doubly earn their fees because they are taking absolutely no risks with their patients.

Popular writers on the subject have all declared that from three to four times as much carbon is required as there is of nitrates and phosphates combined. This is the carbo-hydrate theory in the abstract. Observation and experiment have proved it a false proposition and found why it is false.

The body receives its nourishment by way of the blood, the lymphatics, the mesenteries and the nerves; the first two not only carry good material into its labyrinths but they also carry out refuse. If you have ever observed the "feed-wires" of the trolley on an electric railway you will understand that the nerve ganglia and plexuses, plentifully distributed about the body, play important parts not only in taking on nerve elements but in distributing heat and power.

Of the fourteen elements we ascribe greatest importance to that class which not only furnish building material but have a preservative quality, and we give them as a group the positive sign (+), while to the others, which are only auxiliary, we give the negative sign, (—). These signs are used in the same sense they apply to lenses, for the reasons that + lenses, while having a positive effect to their focal points, become negative thereafter, and — lenses, while always negative, except in the matter of reflection, are sometimes necessary in cases of excess positive development in the eyes. Thus we receive a physical hint from Nature that the principle may be applied physiologically, mentally, dietetically and in many other ways.

The + foods are, as a rule, not so palatable as the —, so that there is always a tendency to take too much of the latter and not enough of the former. Therefore we follow the same rule in prescribing diet that we do with glasses, giving plenty of + and as little — as will accomplish what we desire. It is a more complex proposition, however, because, if we give too much + glass no harm is done but the good intended is not accomplished, while if we give too much + food we do harm by not doing good. Nature guides us in the matter of prescribing, by the reactions. If just the right quantity is taken it is palatable and is assimilated, giving quick benefits; if too much is taken it first loses its attractiveness to the palate, next it sets the teeth "on edge" or nauseates. The — foods are always palatable; one will overload with them, because they taste good, even when experience has taught that the effects will be bad; witness the boy who wanted a second piece of pie, and when his

mother denied him, saying it would make him ill, he replied, "Give me another piece and send for the doctor."

Before prescribing a dietary we must make a complete analysis of the case and classify it. We may find the patient using a + diet but not getting the full benefit of it because of physiological strain from taking it, or from physical defects which require more nerve supply than his machinery can furnish, or from negative habits which tend to neutralize whatever positive effects he may be receiving from other directions.

A case is said to be in the + class when there is a good showing in the history and by the dynamic test, but if the static test shows + symptoms it means he is in a state of irritation and that is sufficient evidence that it is time to regulate the demands upon the nerve supply; in such cases, however, we may expect to find constipation, or in women, dysmenorrhoea, with a bilious tendency. In these cases if we succeed in suppressing the spasm during the first refraction test, the static test, with correction on, may register zero or even a little —, and that symptom then becomes merely a compliment to our work, but if the + impulse remains after correcting errors of refraction, it is nature's way of telling us that we have not controlled the spasm in the eyes or anywhere else, and that we have not the full measure of the errors. If such a case with a + history and a + dynamic test shows — by the static test we would suspect something wrong with the history, because the static test rarely deceives.

A good history with weak dynamic and static tests would still be considered in the + class and would be described as a + case with — symptoms.

If the history is bad, such as constipation, biliousness, dysmenorrhoea, headaches, the dynamic test registers poorly and the static registers zero, we still put it in the + class, with average impulses, although these are the rarest cases we get hold of.

A negative history, with strong accommodation but showing — by the static test, would be classed as a — case with + symptoms, we would expect to find clonic spasm during the refraction test, and among the auxiliary symptoms would be less constipation than in the + cases; in women there would be dysmenorrhoea but with too frequent menstruation, often accompanied by flooding. This class of cases, while causing the most concern to the old school doctors, is our very best reputation maker.

A bad history, with a strong accommodation but the static test registering zero, is recorded as a — case with average symptoms. We are not liable to have much resistance during the refraction test as this class is usually of presbyopic tendencies.

A bad history with a weak accommodation (which is indicated by

nausea following the effort, even though the dynamic test registers well), and the static test shows —, we register it as a — case with — impulses. This case very often has constipation, indigestion and their complementary ills, from sheer lack of nerve supply.

A recapitulation of the above puts it in the simple form of dualities, as follows:

	Dualities
+ Cases	1. + cases with + impulses.
	2. + cases with + — impulses.
	3. + cases with — + impulses.
	4. + cases with — impulses.
— Cases	5. — cases with + impulses.
	6. — cases with + — impulses.
	7. — cases with — + impulses.
	8. — cases with — impulses.

The principal combinations of these dualities are:

First, the extremes, 1 and 8. One is dangerous locally only, while eight is general neurasthenia, dangerous to life.

Second, 1 and 4; the extremes of the + class.

Third, 1 and 2 of the + class, showing the downward tendency.

Fourth, 2 and 3, of the + class, showing when the — symptoms begin to dominate.

Fifth, 3 and 4 of the + class, when it is almost ready to be put in the — class.

Sixth, 4 and 5, which is difficult for the beginner to distinguish from the fifth combination; but as both are treated in the same manner it is only as a test of judgment that we suggest attempt at differentiation.

Seventh, 5 and 6, showing decided decline into the — class.

Eighth, 6 and 7, showing how the symptoms are in the ascendancy.

Ninth, 7 and 8, showing how the + symptoms have disappeared and the case has no promising features.

Tenth, the + and — cases exhibit mental symptoms positive and negative, from the extreme violence of insanity to mild hysteria in the + class and from the latter to extreme hypocondria in the — class.

Reference to the table shows that human milk contains 7% carbonates to 3 1/2% nitrates and phosphates and 89 1/2% water, which tells us that the four vital departments are fat, muscle, nerve and blood. Too much importance has been attached to the fat because it was supposed to furnish heat elements, which is easily disproved by the fact that excessively fat people suffer more from cold than any other class of well people. Indeed they are rarely perfectly well because they lack the nerve supply to carry the weight and heat it, circulate blood and carry off the waste.

	Carbon- ates. (Fat)	Ni- trates. (Muscle)	Phos- phates. (Nerve)	Water. (Blood)
Asparagus	5.4%	0.6%	0.4%	93.6%
Barley	52.1	12.8	4.2	14.0
Beans	40.0	24.0	3.5	14.8
Beef	14.0	19.0	2.0	65.0
Buckwheat	53.0	8.6	1.8	14.2
Butter	100.0		...	
Cabbage	6.2	1.2	0.8	91.3
Carrots	12.2	1.1	1.0	82.5
Cauliflower	4.6	3.6	1.0	90.0
Cheese	28.0	30.8	4.7	36.5
Chicken	1.9	21.6	2.8	73.7
Chocolate	88.0	8.8	1.8	
Corn (Northern)	67.5	12.3	1.1	14.0
Corn (Southern)	39.2	34.6	4.1	14.0
Eggs (White)		13.0	2.8	84.2
Eggs (Yolk)	29.8	16.9	2.0	51.3
Ham	32.0	35.0	4.4	28.6
Lamb	14.3	19.6	2.2	63.9
Lard	100.0		...	
Milk (Cow)	8.0	5.0	1.0	86.0
Milk (Human)	7.0	3.0	0.5	89.5
Mutton	14.0	21.0	2.0	63.0
Oats	56.0	17.0	3.0	13.6
Onions	5.2	0.5	0.5	93.8
Parsnips	14.5	2.1	1.0	79.4
Peas	41.0	23.4	2.5	14.1
Pigeon	1.9	23.0	2.7	72.4
Pork	16.0	17.5	2.2	64.3
Potatoes (Irish)	15.8	1.4	0.9	74.8
Potatoes (Sweet)	21.8	1.5	2.9	67.5
Radishes	7.4	1.2	1.0	89.1
Rice	82.0	5.1	0.5	9.0
Rye	75.2	6.5	0.5	13.5
Suet	100.0		...	
Turnips	4.0	1.2	0.5	90.4
Veal	14.3	17.7	2.3	65.7
Venison	8.0	20.4	2.8	68.8
Vermicelli	38.0	47.5	1.7	12.8
Wheat	66.4	14.6	1.6	14.0

In adding the tabulated figures horizontally, whatever they lack of 100 is waste.

Refer again to the table and see that cows' milk contains 8% carbon and 6% nitrates and phosphates, three-fourths as much of the latter as of the former, an increase in nitrates and phosphates, of about 42% and an increase of only about 14% in carbonates, over mothers' milk.

Or, in a baby's first food we find half as much nitrates and phosphates as there is carbon, and in its second food, three-fourths as much. Another hint from Nature. Then, when we find nearly all patients living on the — foods which contain about two to four times as much carbon as nitrates and phosphates combined, we conclude they have considerable to do with the troubles.

The following cases were not only coincident in the matter of time of their calls upon me, but in the quality of food in relative proportions to their capacity, and their treatment was identical, so they will serve to illustrate the reasonableness of my assertion at the beginning of this chapter.

Dr. S., a physician, graduate of Jefferson Medical College and a practitioner of sixteen years, came complaining of weak ankles, a tired, frightened sensation, excessive perspiration, and general weakness. He weighed 269 pounds, had an enormous appetite, except in the mornings, and ate fairly well then; height about 6 feet 2 inches; age about 40.

Miss C., aged thirteen, of large frame but of very light weight, 65 pounds; appetite good, except for breakfast; anaemic, neurasthenic and inclined to melancholy.

I classified the doctor as + with — symptoms dominating, and the girl as — with — + symptoms. Their diet was practically the same; the doctor ate it because he liked it, and the girl because her parents were trying to fatten her as they believed that fat gave off strength. Following is their list:

	Carbon	Nitrates	Phosphates	Water
Beef	14.0%	19.0%	2.0%	65.0%
Pancakes	53.0	8.6	1.8	14.2
Wheat Bread	66.4	14.6	1.6	14.0
Potatoes	15.8	1.4	0.9	74.8
Eggs (White)		13.0	2.8	84.2
Eggs(Yolk)	29.8	16.9	2.0	51.3
	179.0	73.5	17.1	303.5

Practically twice as much carbon as of nitrates and phosphates combined. The girl had been wearing concave glasses, — 1.00 cylinders fitted by a pretentious oculist, for which I substituted + 1.50 spheres which gave perfect vision. The doctor had 1.25 hyperopia but as he was in the + class I did not insist that he wear the correction. I put them both on a diet of which the following is a specimen; of course it was changed occasionally

to give variety and secure the proper proportions of other elements necessary, which, by the way, take care of themselves if we take care of the principal features, just as the other meridians of a compound lens are taken care of if we attend to the two principal ones:

	Carbon	Nitrates	Phosphates	Water
Fish	0.8%	16.9%	4.3%	78.0%
Oysters		12.6	0.2	87.2
Chicken	1.9	21.6	2.8	73.7
Cabbage	6.2	1.2	0.8	91.3
Peas	41.6	23.4	2.5	14.0
Cauliflower	4.6	3.6	1.2	90.0
	54.5	79.3	11.8	434.2

Almost twice as much nitrates and phosphates as carbon.

To this was added the juice of a whole lemon without sugar, in a glass of water at bedtime; a salt water mouth wash in the morning, followed by a glass or two of water, then fruit to precede breakfast and all other meals.

In one month, to the day, the doctor reported having lost 71 pounds, and feeling so well he exhibited his agility by jumping over a couch in my office. Later his weight increased to 223, when he became alarmed and ceased his carelessness with the result that when I saw him several years later he had reduced himself to 186 and was holding it.

The girl reported occasionally but was not discharged for three months, when she was perfectly well and weighed 110, having gained 45 pounds.

Now the reason she gained weight while the doctor lost is simple. First, the food she had been eating had no nerve or muscle elements in it worth counting and she was unable to digest it, particularly when piled into her apparatus in excess quantities, but by our adjustment of quantity as well as quality she soon recuperated so that digestion and assimilation were perfect; then as there was some carbon in my dietary she used it to increase her weight in proportion to her strength.

Second, the doctor lost weight because we cut down the extraordinary supply of elements, hence it had to come down to the same level. He had been digesting his food but as there were not enough + elements to keep the nerves and muscles up to the standard required to carry the fat he became weak. By our system we reversed the situation and brought his load within his capacity, while in the other case we started the machinery with small loads until it got under good headway, then increased until desired results were obtained. It took longer in the girl's case because she was in the — class while the doctor was in the +. All he needed was to prevent overtaxing his nerve supply, but she required the building up of a sufficient amount to keep her machinery going.

The + class of foods comprises such meats as chicken, game, mutton, veal, pork and beef, except that in beginning with a weak case we omit the last named because it is of more fibrous structure and slower to disintegrate. Fish, oysters, turtles, clams, etc., are all strictly +, having practically no carbon, hence with a meal of fish we allow bread and butter. Of vegetables, beans, cauliflower; peas, tomatoes, southern corn, with relishes like olives, lettuce, cold cabbage-slaw, radishes, onions, turnips, etc., occasionally. Eggs, cheese, milk, coffee, tea or beer, the last three once or twice a day, do no harm and often encourage the patient in following other instructions. Strawberries and other products of vines and shrubs are nearly all +; grapes carry too much sugar for people who are already too fat, and pumpkins, cucumbers and melons are chiefly water. Tree fruits containing one seed are, as a rule, in the — class, but apples, oranges, lemons, pomgranates, etc., are +. Nuts, in limited quantities, are good, but it is not necessary to live on fruits, nuts and water when there are so many other good things. I do not think Nature intended we should slight them.

The — class includes all breakfast foods chocolate, cocoa, potatoes, most cereals, peanuts, sweets, pastry, butter, lard, suet, pancakes, wines and liquors.

In objection to this list my attention has been called to the alleged fact that the Japanese live on rice almost exclusively, yet they are strong and healthy. The statement is as false as that the Chinese subsist on rats. It is true the Japanese use a great deal of rice, but they use as much fish which is more + than the rice is —, then they have an abundance of fruit. It is also to be remembered to their credit that they are a deliberate race, doing nothing hastily or excessively. We can eat almost anything if we are reasonably observant of quantity and avoid overloading. After we get our patients in good condition we allow them to eat anything they like.

Now, as to how to eat and drink: Some insist that food should be eaten very slowly, chewed to fine pulp and saturated thoroughly with saliva before swallowing. I suggest, by the same token, that several chew it, passing it around for half an hour or so. Nothing irritates me more than to see an ignorant faddist prop a paper on the table in front of him and endeavor to read—usually he carries a little box of pills and takes half a dozen of them first. Then comes the hot water fiend and he who swallows a section of hose daily and washes out his stomach. I have never seen one of them who ever amounted to much mentally or physically. It is really better to not chew the food too much, and if thrown into the stomach in chunks it is all the easier disintegrated. Of course there are rules of decency to be observed, but aside from those we care not how fast the food is taken nor how little it is chewed provided

the amount is kept within limits of ability to take care of it. The stomach, in this respect, is like a coal stove; if a fire is wanted no one would be so foolish as to fill the magazine with slack coal, but by putting on a few lumps at a time combustion is better because the air has a circulation; so it is with the stomach; if it be loaded full of finely chewed food the gastric juices are unable to penetrate it and the muscular action cannot help because it is restricted by the quantity, thus the mass lies like lead, while if it were in chunks the liquid could attack it much more readily even if the stomach were so full that muscular action was interfered with. But if the quantity is regulated, even the pulp can be handled better, and, as disintegration is a condition precedent to digestion, that function will be practically assured. I have always eaten fast, talked fast, worked fast, and been rather rapid on general principles, but since I learned how to regulate the quality and quantity of my food I have never known I possessed a stomach, except that I keep reasonably fat and strong in spite of the fact that I do more work than any three average men. I am five feet six and weigh 145 to 150 pounds.

Nearly every patient reports no appetite for breakfast, a fair one at noon and a big one in the evening. Then they wonder why they have acidity of the stomach, bloating and other disturbances. I tell them the only marvellous thing about it is that they do not explode. The drug doctor prescribes for the effects, acids, alkalies, and a dozen other things, with only temporary results, which would come anyhow if the victim would wait awhile. We go after the cause, stop eating, then, if the immediate effects are distressing, we tell patient to take half a teaspoonful of dry salt, followed by a swallow of water to wash it down so it will be dissolved by the gastric juices. Sometimes the salt acts as an emetic—all right, no harm done; it was not sufficient to make the hydro-chloric condition necessary for the work to be done, but was enough to help it unload.

Next we order light suppers, principally of fruit. When a patient declares he cannot stand the acids in the fruit, and that he has too much acid already, we ask where he got his information and usually find he guessed at it. We explain that he is correct in one respect, which is that he is full of lactic and butyric acids from the fermentation of the material in his stomach, but the reason it is there is because he has not enough of the natural acids to accomplish the work necessary for digestion. Not long since an ex-U. S. navy surgeon came to my office, just before noon, in great distress, and wanted to see me immediately. I left my classroom and found him doubled up with pain. I gave him a dose of salt and returned to my work. Fifteen minutes later I came out and he was happy as a clam. He asked what wonderful remedy that was. I asked what it tasted like, and he replied that it was salty. I said it ought to taste that way to a live man because it was salt. He was astonished. Then I

gave his paunch a manual turn or two and told him to drink a glass of sour lemonade with a small piece of cheese for lunch. Then he had another mental spasm. The idea of acid for him! and cheese! why, that would bind his bowels tighter than ever. I denied that anything, except quantity, in the way of food, is binding, and he followed instructions with the finest results. Doctors do not get all their wisdom in the medical colleges; some of it is absorbed from the laity, and his ignorance is a specimen.

After the light suppers we prescribe lemon juice in water at bedtime. This is for the purpose of finishing the work of digestion, cleaning out the liver, kidneys, etc., and to get the gastric juices ready for breakfast. If they are ready, the appetite will be present. If they are not ready we advise against eating. "But," someone says, "How about working on an empty stomach?" We do not allow such patients to work; but they would better work on an empty stomach than on a full one that is not in working order. In a very few days we have aroused the liver and digestive apparatus, when we proceed with a list patterned after the following:

MORNING.	NOON.	NIGHT.
Orange.	Mutton chops.	Chicken.
Applesauce.	Corn bread.	Stewed tomatoes.
Toast.	Cranberry sauce.	Brown bread.
Poached eggs, salted.	Buttermilk.	Water.
Berries.	Sliced tomatoes.	Fruit.
Bread and butter.	Brown bread.	Fish.
Ham.	Pork tenderloin.	Peas.
Peas.	Lemonade.	Toast.
Coffee.		Milk.
Cantaloupe, salted.	Veal cutlet.	Fruit.
Berries.	Cranberries.	Vegetable soup.
Fried corn meal mush.	Medium boiled eggs.	Chicken.
Tea.	Brown bread.	Corn bread.
	Milk.	Tea or coffee.
Fruit.	Fruit.	Fruit.
Ham and eggs.	Chicken.	Sliced tomatoes.
Brown bread.	Beans.	Cheese.
Milk.	Stale bread.	Brown bread.
	Lemonade.	Water.
Fruit.	Fruit.	Fruit.
Cold chicken.	Fish.	Mock turtle soup.

Stewed peas.	Cabbage slaw.	Egg plant.
Corn bread.	Eggs.	Lettuce.
Coffee.	Coffee or tea.	Bread.
		Milk.
Fruit.	Fruit.	Fruit.
Medium boiled eggs,	Nuts.	Fish.
Toast broken in.	Ham.	Sliced tomatoes.
Mutton chop.	Cauliflower.	Corn bread.
Water.	Peas.	Tea.
	Milk.	
Fruit.	Fruit.	Fruit.
Pork chops.	Fish.	Mush and milk.
Cheese.	Succotash.	Stale bread.
Brown bread.	Lettuce.	Apple sauce.
Coffee.	Lemonade.	Coffee.
Fruit.	Fruit.	Fruit.
Fish.	Cheese.	Oyster soup.
Corn bread.	Chicken.	Cauliflower.
Stewed tomatoes.	Vermicilli.	Peas.
Coffee.	Milk.	Brown bread.
		Tea.
Fruit.	Fruit.	Fruit.
Game.	Beefsteak.	Cheese.
Eggs.	Peas.	Poached eggs.
Oysters.	Tomatoes.	Brown bread.
Milk.	Bread and butter.	Milk.
	Lemonade.	
Fruit.	Fruit.	Vegetable soup.
Turkey or duck.	Sardines or salmon.	Cold turkey or duck.
Cheese.	Brown bread toast.	Cauliflower.
Sliced tomatoes.	Milk.	Corn bread.
Coffee.		Tea.

If everybody minded his own business gossip would be unknown.

There are very few real students in the world, and they make mighty little noise.

"The weight of opinion" has suppressed many a good thing. It has also supported lots of things it should have killed.

CLINICAL HINTS.

Have a private office and when admitting friends and relatives of patients have the seat they are to occupy screwed to the floor. Never have more than one extra person in at a time and have a strict understanding at the beginning that they are not to speak unless spoken to, explaining that the nervous system is a delicate thing which is liable to go + or — from causes produced by the operator, to say nothing of outside interference.

It pays to have a large and cheerful reception room with magazines and papers for the entertainment of guests and patients, and a neat reception girl to receive them.

Spend less time in your own reception room than anywhere else. If not busy with patients your work room is your place during work hours.

Free consultation is proper, but limit it to fifteen minutes, during which you can make an estimate of the case, state the amount of your fee, and how it is to be paid; require a portion of it paid at once to bind the appointment for the examination, stating to the patient that you have been compelled to make this arrangement to apply to all equally for two reasons: First, to insure promptness in keeping the appointment; second, because some people will make an appointment when they know they cannot pay the fee and do not want to, hence have no intention of keeping it.

Have a distinct understanding that when you take a case and have specified the time they are to be in your care, the patient having agreed, you will tolerate no interference or suggestions from relatives, alleged friends and others commonly known as "buttinskies."

Impress the patient that you expect to be frank, concealing no detail, taking it for granted he or she is honest in a desire for health and intelligent enough to know that strict obedience to instructions is an absolute essential that Nature may cure, hence any neglect must not be charged to you unless you are the guilty one.

When a patient attempts to argue or to persuade you to change your methods to suit his convenience after you have made an analysis and found what is necessary, show the risk that both of you assume by it, and explain that these calculations are not the fads of a school of medicine, but are direct from infinity. If any fail to see the point, dismiss them; they are breeders of trouble.

Omit nothing in the examination that will give you information concerning the mentality or physical body, from eye strain to corns. Be particular to examine the nose and ears for catarrh; the lungs for the habit of breathing; the heart for the best index to the involuntary current, except possibly the static test; the stomach, liver, etc., by questions, and occasionally, but rarely, a digital examination of the uterus and rectum.

The average heart-beats, forward and back, in the adult are about 80 per minute; in children they are somewhat more frequent, and in the aged are slower. Therefore, when we find a grown person's heart running rapidly it indicates irritation of the nerve supply, and if we find that of a child running slowly it suggests weakness or an unusual slowness for physiological reasons; such children are usually termed phlegmatic, opposed to nervous. When the heart is unusually slow or rapid, keep the ear to the chest for several minutes to see that the rhythm is perfect, which is the main thing. The very rapid hearts often drop a beat in five or ten and usually begin strong and taper down until they drop a beat; those are positively not mitral valve troubles, nor do they involve any of the valves of the heart as causative factors. The whole trouble is in the weak nerve supply, as may be readily proved by having the patient lie flat on a table or the floor for ten minutes. The cause of the nerve weakness may be in one of many departments.

After taking the data upon which your prescription is to be based, unless the case is a very simple one, take a day to figure it out, in the meantime requiring absolute rest, and it is not a confession of incompetence to repeat some tests on a second visit. It is easy to explain to the patient by showing the sheet upon which the calculations were made that this is part of our method of procedure which enables us to be sure we are right.

The matter of diet should be figured out by taking the principal things they have been eating, casting up the points of carbon, nitrates, phosphates and water and preparing the diet so that the figures reverse, to whatever extent we deem necessary; that is, if what they have been eating runs four points carbon to one or two points nitrates and phosphates combined, we make the change at first so that there will be two points of nitrates and phosphates to one of carbon, explaining to the patient that from time to time the proportion of carbon should increase, but never should be allowed to get as high as it was.

Children and old people require more delicate handling mentally and physically than those between 20 and 30, because the children are not yet matured and old folks are on the decline. Of course there is a difference in individual cases, even in those classes.

After the age of fifty if everyone would cut out starchy foods, sweets, such as pastry and all breakfast foods, subsisting largely on nuts and vegetables in summer, with occasionally smoked meats, fish, and with a moderate amount of other meat in winter, they would come as near having the elixir of life as has yet been discovered.

Walking is better exercise than a gymnasium or than riding. Swimming is doubly dangerous for two reasons: first, the danger from drowning, from cramps, etc.; second, too much of it tends to weaken the system,

as does also tub bathing. A little splash and rub down every day in water neither hot nor cold is simple cleanliness. But few constitutions are able to stand cold plunges in the morning, especially very stout people and others suffering from debility. The Turkish bath once or twice a week would kill the devil in two years. It is the nearest a literal hell that humanity can be assigned to. I have never seen a healthy person among all who are addicted to them.

Never forget to wash the hands with soap and water, rinse them and clean the finger nails before beginning work on a patient. The odor from sweaty hands is offensive. After a patient has left the operating room open a window and spray a little perfumed water about.

In prescribing temporary lenses for neurasthenics in whom fogging causes nausea remember they are mentally as well as physically weak, and reduce the fog to the comfort point, but keep it as strong as you can. Fog all others 20/80, or even more, because they are not nearly as liable to look over the glasses as if you gave them 20/30 vision, and their distant vision will be almost as good, while it is still a constant reminder of the doctor's orders.

Beware of prescribing cylinders when they are — .50 or —.75 or less. The way to get around it is, after proving say a — .75 ax. 180, slip it off, hold it in one hand and have a — .25 sphere in the other, the patient looking at the test card; hold the cylinder in front first, then take it away and try the sphere; if vision is not so good, compare the cylinder with a — .50 sphere, if vision is best with the cylinder, leave it; if best with the sphere, cut out the cylinder and reduce the + sphere accordingly. If there is no + sphere in the combination, the rule will work just as well in the matter of substituting the sphere for the cylinder. In other words, theoretically, if a cylinder is correct it ought to give as good or better vision than a — sphere of the same strength, and the fact that practically in the amounts below one diopter it rarely gives better vision than a sphere .25 or .50 weaker is ample proof of the doubtfulness of weak cylindrical corrections. The fact that such patients see a difference in the radiating lines of the astigmatic chart without the cylinder has no influence, unless the patient is going to do such work as would involve such lines, and if he has been doing that work his vision will be so sensitive that he will never let us substitute the sphere in the first place.

Remember that presbyopia should not begin in emmetropes until between forty and fifty, and in hyperopes not until between forty-five and fifty-five, hence when we find one under the minimum age who seems to require reading glasses it is evidence of a nervous deficiency which should be rested, dieted, etc. Particularly with reference to hyperopes under forty-five who have say 1.00 D. or more error, but who have not worn glasses, and insist they only want them for reading, we explain that while

they might be reasonably comfortable with such glasses for a while they are breeding trouble as certain as death or taxes, and in nine cases out of ten it begins at once, because the nerve supply being exhausted when the reading glasses are put on and the inco-ordination remaining between accommodation and convergence, comfort is almost an impossibility. Sometimes we make a concession to such people, which is to give them the glasses they should wear constantly, which of course will be some help for reading, and after explaining the above described situation, tell them when they find these are not comfortable or are irritable that it is a message from Nature telling them they must wear them all the time.

Never make bifocals for myopes, except possibly in a rare case where the distant glass is — .50 or — .75, because in the higher amounts the prismatic effect is unpleasant on account of chromatic aberration. In making bifocals for others the scale for cements should be 13 mm. high, 15 mm. long, 1 mm. up from the lower edge of the lens; they may be set in a little, say 2 mm. toward the nose to suit the convergence while using them.

The pupil distance in glasses for hyperopes should be a trifle narrow than otherwise, because they are going to use them near and far, while for myopes they may be made full width.

Hook temples for glasses should be made long enough so that the tip is just concealed behind the lobe of the ear. Then there is no irritation from the pressure of the temple which is sometimes very annoying if they are made too short.

In cases where the eyes differ so much that one has been used to the exclusion of the other, or when there are oblique axes, the discomfort produced at first is so great that it may even cause sea-sickness. This should be explained previously so that the patient will not become frightened, and we should insist upon their sticking to them, when the trouble will be over in a few days, while otherwise it would last for weeks. The oculists who have perpetrated books call this the point of toleration and advise against prescribing for such. Toleration of drugs is one thing and of mechanical appliances another.

In working on cross-eyes when the patient complains of seeing double we know they are coming.

Sometimes in simple cases of hyperopia the patient returns in two or three days with a frightful looking case of congestion of the conjunctiva, for which there may be two causes or a combination of both: first, they may have caught cold and congestion centered in the eyes because it was a weak spot and offered the least resistance to the current, or the circles of diffusion at the retina caused by the lens and accommodation, from the myopia thus created, but the controlling center having been accustomed to turning on the power for circles of diffusion tackled this one and the results are plain. Reassure the patient by making a drawing showing the story; have him go home and rest a day, using salt water, when he will be all right.

In prescribing applications for the eyes, remember that cold contracts and heat relaxes, therefore, hot water compresses are to be applied in cases of tonic spasm with pain. It would do no harm to salt it except that salt is an astringent, hence would have a tendency to counteract the action of the warmth, especially in the conjunctiva, through which part of the excess blood from the ciliary body finds its way to the veins of the face. Sometimes hot water does not accomplish the desired effect in a reasonable time, say an hour, then we alternate with cold, but not ice water. Another case in which we use hot water is when there is suppuration, the lids stick together and a wax forms among the lashes; hot water will dissolve this wax, which is impervious to the cold. It should be used with a soft cloth, and five minutes to each eye will make it perfectly clean; then apply cold salt water compresses for the purpose of cooling the temperature and for forcing the blood from the veins by contracting the nerves both from the cold and astringent effect of the salt, while the latter also antisepticizes the membrane and takes the gum out of the lachrymal fluid. In very bad cases of ulceration of the ocular conjunctiva, or granulation of the palpebral portion, they should be freely sprayed from an atomizer containing strong salt water, neither hot nor cold, about four times a day, a few good shots, one squarely against the eyeball, one under the upper lid and one on the under lid. The two latter may be made at one dash and should be directed toward the nasal canthus; then following this the patient should lie down and apply the cold salt water compress for a half hour. One of the treatments should be at bedtime, another the first thing in the morning.

In epilepsy, chorea or other nervous exhibits, remember they are not diseases, and the fact that drugs have failed in curing them proves that they must be from mechanical causes, as that is the only classification left. It is true that under such conditions the chemistry of the stomach will be imperfect, and while many of the attacks come on after eating, still it is more mechanical than chemical even then, because they always have the fits in such cases just after overloading the stomach, thus proving that it is quantitative rather than a qualitative proposition. Of course we look after the eyes among others things, and we may safely devote more attention to mechanics even though as a matter of course we watch the quality as well as quantity of food.

Cataracts are opacities of the crystalline humor. They appear in different forms, both to patient and operator. Sometimes the patient says it appears as though he was looking through a spider web; again, vision will gradually become hazy; again, there will be a distinct spot constantly in the field of vision, a good point in advertising is to suggest that the reader cover one eye and then the other and see if vision is equally good near and far, because many people could be saved from bad results if they

discovered the difference in time. To examine an eye for cataracts have the patient in a reasonably dark room (not too dark) long enough to get a dilation of the pupil, then take an ophthalmoscope or retinoscope and if a good red reflex can be seen from a distance of ten or twenty inches it proves there is no cataract. Then take the ophthalmoscope by the direct method, whether you get a red reflex or not by the first test, and if you can see blood vessels it is not a cataract. Before doing either of the above, if the opacity is plainly visible, take a $+ 16.00$ or $+ 20.00$ lens in each hand and illuminate the cornea obliquely from the side with one of the lenses, and if the opacity is in the cornea it will be exposed. If the opacity is rather dim, use the other lens to magnify and make it clear. If the opacity is not in the cornea, but is in the lens this oblique method will show it lying closely behind the pupil. Many of the cataracts, so-called by oculists, are simply corneal scars, the result of ulcers.

The use of prisms as a treatment for cross-eyes is foolish, for so-called muscular insufficiencies, a misdemeanor, and to use them to prevent double vision is a felony, because it creates cross-eyes. Eyes may cross up or down, in or out, and the way a prism prevents double vision is by practice cally excluding one eye so that a so-called single vision is with the other alone and is not binocular.

Some very sensitive people occasionally complain of seeing every object with a sort of spot in the center, particularly small objects like letters, and sometimes they explain that there appears to be two objects, the ghost on top of the real. A young lawyer of Chicago came complaining of this symptom and said that a prominent oculist had made an examination and told him he had had a hemorrhage in his left eye which left a spot of extravasated blood which caused the symptom. Inasmuch as the size of the retinal field occupied by the image of a small letter at twenty feet would be very small and the spot of blood would have to be smaller, something the size of a pin point, it struck me that the doctor was either a marvellous man or liar. and when the patient told me that if he covered one eye, it made no difference which, the spot disappeared, I became firm in the latter conclusion. Then he demanded an explanation from me. He was the most highly strung nervously of all the patients I have ever had and I reasoned that it must be a case of anisometropia, and as vision was so keen with either I suggested that possibly he had $.75$ hyperopia in one eye and 1.25 hyperopia in the other or 1.00 in one eye and 1.50 in the other and when using both eyes together, accommodating the same amount in each, it left one under-corrected $.50$ or the other over-corrected $.50$, which would be just sufficient to make the ghost appear. After explaining this proposition to a class I used him as a clinic and found $.75$ hyperopia in one eye and 1.25 in the other and with these glasses on the ghost disappeared.

The last paragraph suggests another case which is not often found. It is possible sometimes to give a patient pretty good vision for distance with correction, but when it comes to the reading point no glasses will help and if the accommodation is active in a young person he cannot see to read. This is because a very small field in the center of the macula is healthy and sufficiently large to receive the small image of distant objects, but immediately outside of that there is a dead space, hence the larger images of near objects are not transmitted to the brain. Again a case may be found where distant vision is bad and cannot be improved yet the patient can see reasonably well to read even without glasses. In this instance the situation is reversed; it is a central atrophy with a healthy periphery.

When a patient, or other person, happens to faint in your presence or have any kind of a falling fit, be careful to keep the body horizontal, if any change put the head the lowest, and apply cold water, either sprinkle, dash or use wet cloths. A bottle of strong pleasant perfume is better than camphor, ammonia or any other drugs. A sip of clear water is better than liquor and not half so liable to strangle. Manipulate the arms and legs a little, but be careful not to worry the patient. As soon consciousness is restored a little pinch of salt or a swallow of lemonade will settle the stomach. In the convulsions of fits do not undertake to hold the patient rigid, but just keep him from hurting himself.

By way of illustrating the deviltry of prisms we have the following showing the relative proportion of the total strain to the original impulse in an emmetrope whose convergence was irritated to the amount of 1.00 D, with a 4° prism, and a hyperope of 1.00 D.

Convergence from 4° base out, L.	.50		
	R. .50	1.00	original impulse.
Automatic accommodation, L.	1.00		
	R. 1.00	2.00	automatic increase.
		3.00	total damage.

Increase over original impulse, 200%.

Effect of hyperopia:

For accommodation, L.	1.00		
	R. 1.00	2.00	original impulse.
Automatic convergence, L.	.50		
	R. .50	1.00	automatic increase.
Negative pull, 6th N., L.	.50		
	R. .50	1.00	voluntary increase.
		4.00	total damage.

Increase over original impulse, 100%.

The old-fogy idea that small pupils mean spasm and large pupils means the reverse has caused the death of many persons from drugs

administered wrongly. To us the significance of the size of the pupil is absolutely nothing unless corroborated in other directions. A small pupil may appear in a debilitated person who couldn't raise energy enough to have a spasm if he were paid for it, and a large pupil is very often found in people with a severe tonic spasm because the nerve branches operating the iris were put out of action by the ciliary disturbance.

In cases of very high degrees of hyperopia, say 6.00 D. to 10.00 D. we sometimes find after getting on all + we can that in adding for reading it takes considerable more increase of power than the reading distance calls for. For example, we have found + 6.00 and have to add + 4.00 for reading at 13 inches. Our physics tells us this is wrong, so increase the + 6.00 to + 7.00 and find the patient sees as well at a distance as with the + 6.00, which proves once more that the Infinite Creator did not make a mistake.

Polyuria is not indication of kidney trouble in more than one-tenth of the cases it exhibits. It is most frequent in women and the old schools claim it is proof that they have more kidney trouble, when as a matter of fact they are notably free from it, and the symptom is nearly always due to a stricture of the muscular structure around the neck of the bladder due to sympathy with the accommodative effort caused by hyperopia.

Similar conditions in men usually mean the involvement of the prostate gland and irritation of the urethra, which is about eight inches long. In these cases while hyperopia is often a primary factor, sexual excitement intensifies the trouble and may cause it in emmetropes. The after-effects are incontinence, emissions, and finally impotence. The treatment for prostatitis, hydrocele, varicocele, urethritis, gonorrhoea, are all the same, a + diet, correction of eye errors, rest, avoidance of liquor and tobacco, sexual excitement and bougies. A fine-pointed rubber syringe may be introduced one-half or three-fourths of an inch and cool salt water injected night and morning; otherwise let it alone.

Pains are nearly always referred to a point comparatively remote from the primary cause; thus a disordered liver will cause a headache, and the pressure of a shoe on a corn will irritate the entire nervous system. But sometimes pain is referred to the seat of the primary cause by reflex action, as for instance in hyperopia the effort to overcome it by accommodation produces a tonic spasm throughout the entire system and the pain in the eyeballs is from the secondary irritation.

Fever is not an excess of blood heat, but it is a general or local irritation of the sensory nervous system which the blood is unable to cool. It therefore follows that fever is always a product of a mechanical disturbance, even though that action was a product of chemical reactions.

Sometimes we have a combination of fever and pain from chemical and mechanical causes; thus what the old schools commonly call gastritis or inflammation of the stomach is only true in a secondary sense. A more apt term would be gastralgia, because the slight inflammation is only incidental and if we remove the cause of pain the inflammation will disappear magically. In this case the cause is often local from overloading or from improper food which caused chemical reactions to be imperfect, fermentation occurred, gas formed, the mechanical action was interrupted, hence the pain.

Hernia or rupture of the peritoneum is treated by operation or by the injection method, the latter being the best, all things considered. A weak solution of carbolic acid is used hypodermically and the patient should be kept on his back for at least three weeks. First, put back the protruding gut, then create an irritation by two or three injections in the field about the opening, allow a few days for it to heal, then repeat the operation and thus increase the field of scar tissue in area and thickness. Two weeks should be sufficient to accomplish the work, and allow a third week for the final healing. The patient may get up for stools to void urine and for meals.

Metaphysically, a common teaching is that "an honest confession is good for the soul." Analysis shows this to be a rank humbug unless the confession be confined to oneself. There are cases where it would be decidedly wrong to neglect to make verbal as well as other amends for an injustice done to another, but there are many cases in which a confession would be misconstrued either through ignorance or maliciousness and thus more harm be done to both parties than if the oral part of the amend had been omitted. For example, a man may, in the heat of passion over some trivial irritation, by his wife, give expression to words or acts that in cooler moments he decides were unnecessarily harsh and feels that he should apologize. This is certainly manly as far as it goes, but he should in those cool moments consider the disposition of the said wife and if he knows that she will take advantage of that confession to humiliate him before others or to recall it as a proof he is wrong in some other matter that may come up subsequently, he would better let her remain under the impression that he still feels he was right, but show by his conduct that he bears no grudge. In other words, never make such confession to a person whose caliber is such that it will cause him or her to assume a false superiority.

In questioning patients, do it deliberately, and form the habit of consecutiveness; that is, begin with the questions regarding memory, etc., headache, eyeaches, toothache, nose, throat and ear affections, and so on down. Never ask a question without getting an answer; if the patient refuses, close the conference. If you ask to take the patient's glasses and he folds them up and puts them in his pocket, get the glasses, then delib-

erately lay them aside without looking at them and go on with your work. This is part of the true fogging system.

The manual treatments that we give are merely emergency treatments and only incidental to instructions to the patient because our patients treat themselves; we are only the consulting doctors.

Quite frequently we have for patients young girls from the age of puberty to about twenty years, whose general appearance is healthy but who complain of a constant tired feeling, and the examination (ophthalmoscopic), shows a very great lack of red arterial blood, while the venous blood may not be off color; the general field of the retina will be quite pale, and sometimes the larger veins may be extra dark. Such people will confess fainting spells or at least attacks of nausea and faintness, even if there is no swoon.. They usually suffer from dysmenorrhoea and often menstruate every three weeks. Occasionally cases of the latter kind are found in people thirty-five years old, but such usually show debility in their countenance.

Boys between the ages of twelve and fifteen often go through peculiar systemic changes similar to those of girls, and not being able to find relief in menstruation, become so debilitated that they do not regain normal vigor until about twenty, unless they fall into our hands and go through a regular course.

The so-called tobacco-heart of the old schools is not due to tobacco, as is easily proved by permitting the patient to continue its use while he takes our treatment. Of course it is a part of our system to stop excessive indulgence in any bad habit, but every patient has more than one cause for his troubles and if we take care of all the rest Nature will do her work in spite of a small one like that. However, after we have proved it was not the tobacco, we recommend the discontinuance of it on general principles.

A fundamental principle of our system is moderation, hence we do not require total abstinence from anything, but teach temperance.

Working people who are patients will often object to our dietary, saying that the quantity is insufficient for one who performs manual labor. We reply by asking him how he knows. He will say then he believes it. To this we suggest that as we are the doctor it might be a good idea for him to follow our instructions and find out whether the opinion of a layman is as good in that respect as ours. We explain that it is not what one eats but what is digested and assimilated that does good. We tell him that the very fact he came to us is proof that his own ideas are not very good and our purpose is to reduce the quantity, change the quality, and increase the variety until we find what his machinery can take care of, and when we find its capacity we will show him that while he may safely take on a little more than we start him with, he will get better results from our

meager diet, which is very far from the starvation point, than from his own practices.

Children who are growing actually need more food than grown people; first, because they have not only to sustain, but to build, the body; second, digestion with them is more vigorous unless it is suspended by overloading, and it is more difficult to overload them to that point because the muscular coat of the stomach is more elastic. If proper attention be paid to the quality of their food there will be a more even distribution and a greater return from the amount taken in the building up of the nerve and muscle supply, for the growing child needs more of the + elements than it does of the fat making ones, and with these supplied he will soon eat regularly and not suffer the all-gone feeling a half hour or so before meals. But provide for such emergencies; let him have an apple or an orange, because it will not affect his appetite.

Some very hearty eaters complain of a return of the hunger within a couple of hours, which they gratify by eating some more and then have sour stomach, bloating, etc. The alleged hunger is not hunger at all; it is simply a call for help from the stomach which is unable to disintegrate the food properly, and a half teaspoonful of salt or the juice of a lemon in a glass of water, or both, will furnish the elements necessary to reinforce the gastric juices.

As to instruments for making eye tests, after the ophthalmoscope I would rather have a dollar stereoscope than all the phorometers, optometers, etc., on the market. It is made upon a physical principle with prisms base in that proves our physiological principles with reference to the meter angle of convergence caused by prisms base out or saved by prisms base in, and in case of tonic spasm exhibited by the + impulse in the static test, we might use such an instrument successfully sometimes in an effort to break down the spasm.

A platform scale is a necessary part of a neurologist's armamentarium.

Referring to the eyes and their exhibits of spasms, we have two kinds, clonic and tonic; while the first is intermittent and the second constant, the latter being only a more intense form of the first, it may be understood readily that either may tend toward the other because the dividing line is not established like a pencil mark. For example, a tonic spasm may relax a little under our manipulation and thus become clonic, while another case with clonic spasm may suddenly become tonic while we work on it. This may even go so far that the static test will show a + impulse before correction and a — impulse afterward, or the reverse. This is why we make the static test twice. Clonic spasm is expected in all cases under the presbyopic age, that is, under about forty-five years and when we do not find it at least moderately, it is sufficient proof of general weakness to require the patient to stop work. A moderate amount of it can be controlled

by our systematic methods, mental and physical, and immoderate amounts are treated the same as tonic spasm because they are bordering on that extreme condition. Such cases should also be required to rest unless the dynamic test before and after correction guarantees a bountiful nerve supply.

While it is against the principles of neurology to worry a patient by long-continued efforts to break down tonic or clonic spasms, yet it is sometimes possible to accomplish it quickly by moving the patient closer to the test card, say ten or fifteen feet, when, everything being more distinct, his controlling center gets a better grip on it and we can at least measure and prove whether there is astigmatism; then after reducing the spheres until vision is what it should be at the distance the patient is seated, if the static test shows a + impulse we increase the spheres arbitrarily according to the neurometer instructions. Sometimes we find it best to not unfog the patient until he sees quite as perfectly as he should, and in such cases when it comes to adding for his + impulse we must allow about + .25 for the amount already on.

Clonic spasm must not be confused with neurasthenia, as it is liable to be on account of one exhibit, that of seeing better one moment than another with the same lens; in the clonic spasm the patient may change a line or two or even more, but what he sees each time will be distinct, while in neurasthenia vision is fairly good one moment and the whole card fades away the next, while a sensation of nausea or faintness will be admitted; also the neurasthenic will exhibit this feature without glasses.

If the static test shows a — impulse it is either neurasthenia or a clonic spasm, but if the test shows a + impulse we would always class it as tonic spasm although in some cases we might be able to push it over into clonic and correct the error.

Clonic spasm signifies an exceeding irritation and very likely cyclitis, which requires rest, for two reasons: First, the possibility of local damage from adhesion of iris and lens in cases where the pupil is small, or possibly from infection of the conjunctiva or retina; second, the liability of causing cerebral hemorrhages from interference with circulation by the general spasm. This is more liable to occur in persons who are extraordinarily stout and who have reached the stage where they are highly nervous, because the walls of the blood-vessels are weaker, hence more liable to rupture. There is also the possibility in thin people of cerebral paralysis and softening of the brain, or paresis, which is practically the same thing.

Catching a spasm at work is one thing and getting control of it is another. As we know the symptoms we know positively when we have controlled it and we also know positively when we have not. In the latter instance we fog the eyes and demand rest until the spasm breaks, or if we

allow the patient to continue at work, which we should not do, we get a written contract that he assumes the responsibility.

The static test may show orthophoria from a tonic spasm in the 6th nerves as well as the 3d, but in such cases we would detect it by the pain intraocularly, or the test may register zero from a reasonably good supply of nerve force yet the case develop quite a clonic spasm during the refraction test. Such cases are as a rule easily handled, although they are liable to deceive us into unfogging too much, unless we watch them carefully.

Don't forget that myopes are very liable to spasm from the accommodation coming automatically with extraordinary convergence, even though they show zero or — impulse by the static test. The possibilities of spasm in myopes of high degree are so great that if the patient is seated ten feet from the card without being able to see it, and we could get 10/15 vision with strong lenses, we would stop them at 10/80 if they had never worn glasses, or even if they had but were suffering from hyperopic symptoms, unless the general test combined showed such weakness as would warrant giving as much as 10/15 or 10/20, and even that must be supported by the fact that the lenses we give are so decidedly weaker than the ones they have been wearing that it is a clear case. It is nothing for us to steal 2 D. or 3 D. from the — corrections of the average oculist or optician and still leave vision as good; therefore if we find a case where we cannot steal as much as a diopter and still preserve good vision we steal more and let the vision go.

In low degrees of myopia that have been fitted by other people, knowing their failings, we sail in to get + on, and in these cases, which are decidedly the worst of all we have to deal with, because they are liable to have a tonic spasm yet dodge all tests, we waste no time but fog to 20/80 or 20/120. An interesting thing about these cases is that while vision may be as bad as 20/60 with the naked eye we often get a + 2.00 on and vision be as good as 20/120, and we finally get as much as a + 1.50 cylinder or + 1.00 sphere + 1.00 cylinder, where the other fellow has — 1.00 or — 1.50 cylinder, and we sometimes get simple + spheres, + 1.50, where they have been wearing — 1.00 cylinders.

Having adopted the eyes as the gauges of the body, and utilized them as such objectively and subjectively, the first, macroscopically and ophthalmoscopically, the second, dynamically and statistically, we know that as a rule deep-set eyes or bulging eyes with a low nose bridge, vertical wrinkles in the forehead, etc., are objective symptoms that the gauges will need fixing. The subjective tests are equally simple when understood, and much more certain, indeed we diagnose objectively and analyze subjectively. Dynamic tests of the gauges mean different things at different ages and under different circumstances. The operator must be very familiar with these facts and know why the facts are. For example, children under ten

years of age rarely show any more power by the dynamic test than those of that age, for two reasons, first: the eyes do not develop full growth and power until about the age of ten years; second, a ten-year-old can reach the limit angle of convergence, which is $2\frac{3}{4}$ inches, and the younger child could do no more, hence we begin our figures with that age and 14.00 D. Between ten and twenty years the child may have enough accommodation and convergent power above normal to overcome its hyperopia and come to the normal point, but when we put on the correcting + lenses it will not be able to show any greater power than before, because it has reached the limit angle of convergence, but we know that it has more power than it shows with the lenses because it came to the same point or nearer without them. Example: Suppose a child shows 12.00 D. accommodation by coming to $3\frac{1}{4}$ inches without glasses, but by a test we find hyperopia of 2.00 D., we know that in order to come to $3\frac{1}{4}$ inches without glasses it must have been accommodating 14.00 D. and we give it such credit even if it can show only 11.00 D. with glasses on. If such a case shows an increase of accommodation after correction we know it should not be able to do so were it in good condition; therefore, it becomes a symptom of weakness in that child to show strength. Above the age of twenty years up to about thirty-five years, the near point recedes beyond the limit angle of convergence on account of the decrease in his dynamic facilities. We make the test before correction, then expect him to show an increase equal to the amount of + sphere in the correction. If he fails to do it, watch out for spasm, and if he shows more increase than he should it is a symptom of weakness which prevented him from showing as much as he ought in the first place. After the age of thirty-five, when his near point is still farther away and his dynamics naturally weaker, we expect him to show an increase at the second dynamic test two or three times as great as the + sphere in the correction, until between forty-five and fifty, when presbyopia begins; therefore, if he fails to show an increase it tends to throw him into the next younger class, and is, therefore, a symptom of strength, or it may be one of many symptoms of great weakness. The way we differentiate the complication is, if a big, strong-looking fellow shows 6.00 or 7.00 D. accommodation at the first test, we know he is extra strong and do not expect any increase later, but if he starts in with only 3.00 D., 4.00 D. or 5.00 D. and appears to be presbyopic after correction so that he accepts addition for reading, yet is below forty-five years old, we take it as a symptom of weakness worth more than a half dozen symptoms of strength, and we order rest instead of adding for reading. This is of course subject to modification if the patient has been wearing glasses constantly and the nature of his work, habits, etc., has been such as to produce presbyopia prematurely.

Briefly, if any one of these classes show symptoms of the next older

class it means weakness, and if he shows those of the next younger, it means strength. Of course the first class have no younger class and can go wrong only one way, while the middle class can go both ways, as can also the third class, because there is still a fourth in which the weakness exhibited is from natural presbyopia.

There are other ways in which the dynamic tests are valuable, which are set forth in the neurometer. First, when we make the first dynamic test we form a diagnostic opinion by combining it with the general appearance and history of the patient. Thus, if a child under twenty years shows only 6.00 D. or 7.00 D. accommodation, we know, looks or no looks, that it is in a bad fix, but if it shows 11.00 D. or 12.00 D., when we think it ought to show 14.00 D. we conclude it is either weak or is overcoming a great deal of hyperopia, and it amounts to a symptom of weakness in either case, which makes us wary. Or. if we find 7.00 D. in a person whom we think ought to show 10.00 D., it is a caution signal, although we may find the patient older than we think, and if we do, it is a reassuring symptom.

Sometimes as a matter of proof of our system we first take the dynamic test, then put on a pair of + 3.00 spheres and repeat the test, then ask the patient's age. From this data we proceed to figure out the amount of error that should be present. Thus a case showed by the first test 3 1/2 inches or 11.00 D. Adding + 3.00 D. and repeating the test he shows 2 1/2 inches or 16.00 D. Subtracting the + 3.00 from this leaves 13.00 D. to be credited to him; hence if he had 13.00 D. power with which he showed only 11.00 D. he must have been overcoming 2.00 D. hyperopia; or, after finding the 13.00 D. which indicates 12 years, 6 months by the neurometer, we added 10 years for mentality, which brought it up to 22 years, 6 months, then we asked his age, which was 29 years, 5 months, 8 days. The difference between this and 22 years, 6 months, equals 6 years, 11 months, 8 days. The nearest to this amount shown by the neurometer is 6 years, 3 months for 1.75 hyperopia or 7 years, 6 months for 1.50 hyperopia. We chose the former because it is nearer to the result of the short calculation. Hence by one calculation we found he should have 2.00 D. hyperopia and by the other 1.75 D. hyperopia. Of course this being found by the dynamic test alone was not as reliable as if we had completed the analysis, nor could we find astigmatism by this method, but it is one of the many things that go to make up the proof of the accuracy of our methods. A complete test of this case found 2.00 D. hyperopia.

Another dynamic feature in symptomatology is found in the reactions of the dynamics during the refraction test. If the patient sees better one moment than another with the same lenses, or if he improves a certain amount with a — .50 in front of the fogging lens and then requires more than that to improve an equal amount more, clonic spasm is indicated, or if he improves as much with a less amount of lens it also indicates clonic

spasm, but at the same time we caught it on the reaction; but if in connection with the first named symptom, that is, seeing better one minute than another with the same lens, there is also nausea on the down turn, it signifies general weakness.

Another form of dynamic test is developed subjectively by cross-questioning. If a patient has a dry, itchy eye or difficult urination, or dysmenorrhoea, or piles, or even finds it difficult to swallow, they are symptoms of irritation, and we call them $\div$ because they signify sphincter contraction or spasm.

If the eyes are overflowing with tears or there is urinal incontinence, or, if the menses are too frequent, even if there is dysmenorrhoea, or if there is constipation with a combination of other — symptoms, we know that it is due to nervous inability and that there is danger of a general paralysis.

Acute headache means spasm, but when they reach the stage of sick headache it means exhaustion of the general supply. Dull, continuous headaches indicate an overworked liver and a consequent weakness of the nerve supply; but this symptom is rather one of caution and a suggestion to remove the pressure in order to find whether it is genuine weakness or only a temporary disability. In such cases as this it is best to demand a good fee, because while it may be temporary, hence quickly repaired, it is just as liable to be a chronic case. Of course we form final judgment by the general appearance, history, static tests, and the final analysis.

The first static test is that in which we delve into the history of the case, and as we also get some dynamic information from the history we must learn to separate the static from the dynamic symptoms as we go. For example: A patient tells, with reference to his occupation, that he does certain things, and the fact that he does them proves that he must have considerable force at his command, but when we ask him how he feels afterward and he says "It knocks me out," it becomes a static symptom of weakness which overbalances the other; then the two together form another symptom which tells us that his mentality is a dominating element which must be considered in the final calculation in figuring his age. Of course we must also find how quickly he recuperates after these excesses, and if for instance he wakes up refreshed the next morning, it is a $+$ symptom, while if he is still tired it is a — symptom.

Again, if a patient does not report doing things, but on the contrary is doing practically nothing, yet complains of a constant weariness, it is a bad negative symptom; this is particularly true of young women, and it is quite common among them; and, for the reason it is rare among young men it is serious when we find it.

Objectively the ophthalmoscope is a static test by which we ascertain the nourishing quality of the blood, knowing that the arteries should main-

tain about 80% red and have a light streak down the center, while the veins should have a darker shade and the streak be fainter. In anaemia the arteries sometimes appear extra pale and the white streak occupies $\frac{2}{3}$ instead of $\frac{1}{3}$, the veins appear still darker and the contents more like wet sugar; that is, there will appear little globules or sediment.

Another static test is with the double prism and red light. A light being placed at fifteen or twenty feet should appear as three, two being seen by one eye and one by the other; the latter should be in the middle and all on a vertical line. If the middle one is out of line, the objects seen by each eye swinging to their respective sides, it proves weakness, no matter what the dynamic test showed; but if the objects swing to the opposite sides it is proof of spasm, no matter what the dynamic test showed. If the middle light deviates up or down, alone or in connection with the out or in turn, it simply means a complication in the nerve distribution, which always means rest. Of course this test is repeated after correction of error, and if the — indications are still present it increases the importance of the symptom with reference to the final prescription, and if the + impulse still remains it tells us we have not the full correction of eye error, and we increase it as indicated by the neurometer; if the up and down turn remains, it indicates rest and is a — symptom even if it appears in connection with the + symptom when the lights cross over.

The greatest and most far-reaching symptoms are in the habits and dietary; the former because they teach us to watch everybody and note the effects of dissipation, mental and physical, and the latter because it affords the only opportunity for exact figures on the situation outside of the eye figures, and we have in this a greater scope because we not only figure present conditions but future ones, while the eye figures enable us to tell only present conditions and prospects and to measure the progress of the case as we proceed with it.

Always do the easiest task first.

Jealousy ranks next to murder in my estimation.

It is really wonderful how wonderful a man has been—after he is dead.

It is better to do many good things and not be discovered than to commit one bad act and get caught.

A born teacher can not help it any more than the other fellow can overcome the fact that he was born the other way.

There are always two sides to a question, and it is the other fellow's side you want to hear. You can get your own any time.

A man is not always great because he occupies the space of a great man. He may have merely fooled some people into the belief that he is great.



This is the wife of a Minnesota doctor who not only had a divergent squint but had been given up to die from tuberculosis. She had not done any work for a long time. After six months' neurological treatment, she has been doing the housework for her husband and six children over a year.



The lower picture of these two shows this young lady as she was two years ago, under sentence of death in a few months from tuberculosis.

The top picture shows her as she was when she was told she would be dead, and as she is now.

Six eminent Indianapolis doctors pronounced her doom.

Three months of neurology made her strong and happy.



These eyes straightened instantly. The pictures were taken fifteen seconds apart. But remember, all do not yield so readily. It sometimes takes several months. Even that beats operation with the chances that go with it. A little daughter of the deputy sheriff at Wooster, Ohio, was given an anaesthetic before such operation and she died before they could operate.

One of my pupils had offered to do the work for \$50 without even local anaesthetics or knife, but when the local doctors found it out they ridiculed the idea and sent to Cleveland for an alleged oculist who murdered her. Then the undertaker's bill was added to the doctors' bills and the little girl is no more.



This case of cross-eyes, after running thirty-six years, was fixed by our methods, without knife, scissors or pain in twenty minutes.



These pictures were taken twenty minutes apart. The work is another specimen of what neurology and ophthalmology can do without danger of blood poison.



This case of cross-eyes was straightened instantly by one of our boys. It is such work as this that makes the old-school cutters want laws to put us out of business.



These two pictures were taken a week apart. Some one says, "Oh! but they have to wear glasses all the time." So they do if they are operated, or the eyes will soon cross again. In the rare cases they do not recross there are other troubles which the oculist cannot take care of.



Here is a little girl who was not only cross-eyed, but her disposition was twisted so that she was a charge.

These pictures were taken two weeks apart, hence it was four weeks from the first to the last and her mother reported there was as much change in her disposition as appears in her face.

An operation might have straightened the eyes, temporarily, but it could not have touched the disposition, because glasses are not nearly all of the neurologist's armamentarium.

Neurology isn't any old thing some cheap imitators choose to call neurology.



This is a little Indiana lady who was made happy by our methods, in about two months. Her parents objected at first, and the old-school doctors fought for operation but common sense won the victory.



This is a ten minute case, and was done by a progressive man who takes "The Ophthalmologist," from which he learned how to fix cross-eyes. Some day he may learn more of our methods. Possibly from this book. If I could have him with me personally for a few months he would be surprised at the things he could do.



This is a case Drs. Mayo, of Rochester, Minn., one of whom is now president of the American Medical Association, failed on. One of my boys fixed her in a month. Dr. Mayo gave her

L. +2.00+2.00 ax. 90

R. + .25+ .50 ax. 105

My lad gave her, for final correction, after the eyes were straight

L. +3.00+2.00 ax. 90

R. +1.75+ .50 ax. 90.



The little girl in the picture on the left was seven years old, eyes crossed in babyhood, straightened in twenty minutes.

The other is a four-year-old, eyes crossed three years and came all right in three days.

METAPHYSICAL PORTION

The history of "Christian civilization" is the bloodiest of all histories.

The principles of Christianity, as expounded in the bible and exploited by the preachers, are the duality, a bribe and a threat.

Christianity and medicine are the only two professions which are divided in themselves, and the christian bible declares "a house divided against itself shall fall."

Christianity and Drug Medicine are the biggest humbugs the world has ever known.

METAPHYSICAL PORTION

GENETIC PSYCHOLOGY

**A Philosophy Supported by Facts Apparent To-day Instead of by Myths
of Dead Ages.**

Genetic psychology (beginning of mind) offers a study which yields pleasure and peace most alluring to the mentality. It brings one up against facts and logical conclusions. It does not revel in ghosts or dreams. It breathes no threats. It is not dogmatic nor intolerant. It teaches reason instead of superstition, order against chaos, argument supplants fire and sword. It makes no demands on the student to accept as true that which he cannot understand, simply because it is beyond his comprehension. It teaches to accept the positive evidence offered to-day, in Nature, rather than the traditions of primitive ages.

We reason positively from effect to cause and negatively from cause to effect, because only an infinite mind could know in advance the effect of a cause. We see all about us the wonders wrought by the hand of man guided by his mentality. We have the history of his development in modern times and the folk-lore of the ancients. The latter is largely devoted to how the leaders kept the masses in subjection by miracles, but the first-named dare not attempt such absurdities. We are accomplishing new feats almost daily so much more wonderful than the ancients ever dreamed of that the greatest wonder is there are still those who prefer to cling to superstitions that promise heaven to those who pretend to believe and eternal torture to those who are so honest with themselves they reject the proffered bribe and ignore the threat.

When we think of the caves of our ancestors in comparison with the homes of to-day; of the canoes and the palatial steamers; of the trackless

forests and the railways; of the foot-messengers and the telegraph; of the laborious sign records on pottery and the perfecting presses; of the primitive spears and the modern battleships; all tell us a story of progress, of growing mentality that only the malicious, the ignorant or the insane could subordinate to Jew fables. And even they join in honoring the men and women whose minds have enabled them to achieve all that is in evidence as human products.

Then, when we see Nature's work on every side, in the universe, in the day and night, in the seasons, in the storms and calm, in the fruits of the soil, in the beasts, birds, fishes and in mankind, it sets us to thinking backward toward the cause, thence forward toward the effects. They are two great problems, too great to be settled by a prayer and too important to be farmed out to men whose calibre commands only a few hundred dollars and a donation party annually. We have the examples before us of what the minds and hands of man have accomplished and it is only natural that we conceive that other minds and hands, as infinitely greater than ours as the works in evidence are greater, did the work, and are at it unceasingly. It may even be one mind that is doing it all, but if so it must be an almighty big one, and as to hands, possibly when such a mind works it needs no hands. Then the idea comes that our minds, being the infinite, invisible, undiscoverable part of us may be and very likely are an atom of this universal mind; and if this is so, we should let it work along lines consistent with the master mind instead of polluting it, with doctrines conceived by mercenary and superstitious people who existed thousands of years ago.

I can imagine a mind so much greater than man's that it has existed from a time so long past that this earth did not exist, and that will exist long after this planet's work is done—for why should not planets die as well as men? I can imagine such a mind with a purpose so vast that our minds and purposes only compare with it, as a grain of sand compares with the earth in size. I can imagine that what we call troubles, and some call judgments, are a part of a great plan, each of which is of no more consequence to the plan or to the great mind than the rheumatism of an ant is to our minds. I can imagine that our minds are part of this great mind and that as we cultivate our opportunities they may be more active parts. I can imagine that when our visible bodies die these parts of the great mind which have occupied them may return directly to the great mind which pervades everything, or it may be utilized separately in another form, but that it exists so long as the great mind exists is a reasonable proposition. But I cannot conceive this great mind in the form of a person, subject to fits of temper, creating a thousand millions stars, suns and moons, to be subsidiary to this planet, the inhabitants of which he made to be free agents, knowing they must fall into sin by violating his

personal commands, then all who fail to seek forgiveness—and contribute to the support of a priest—will be consigned to eternal torture, while those who are “believers” will have everlasting life and happiness—but they must die to get it. I can conceive the primitive minds of the aborigines likening the infinite to their own mental vagaries, but I cannot reconcile the assumption that the minds of to-day are subordinate to those of two thousand or five thousand years ago. I can see consistency in the comparison of present minds with those of the ages when mankind herded in flocks and wore skins of animals instead of clothing spun and woven, but I cannot conceive those people receiving messages from a personal god and handing them down to us as law, when it would be so much more convenient for said god to communicate directly with the superior minds of to-day. I can imagine why an infinite mind would desire to keep in constant touch with its workings and have evidence that it does, day after day; but I cannot conceive why it would give a law unto primitive minds and then abandon them to their own notions while continuing to guide the rest of creation. I can see why “dust returns to dust,” but I cannot understand why the great mind should send part of itself to hell. I can conceive a reasonableness in discrediting our fellow men who ask us to believe assertions without offering logical evidence, but I cannot imagine an excuse for believing that any woman ever gave birth to a child without following the natural order of procreation, or that any people who believed the earth was flat and tortured those who discovered it was round, should be accepted as authorities in other matters, temporal or spiritual. I can even conceive a possible beneficence in the master mind directing that the finite minds should be semi-independent of itself, but I cannot imagine it trusting all subsidiary minds to any one or any thousand other minds any more than I can conceive one dime dominating other dimes. Therefore that part of the infinite within me inspires a disregard of other finite minds and their expressions except as they conform to the inherent conception of law and order as it exhibits in my own mind consistently with other things in evidence over which the finite minds have no control.

Genetic psychology, therefore, may be said to be, in its practical sense, the ability of each individual to divest his mentality of the false notions that have been educated into it with reference to both mind and matter, and to open connection directly with the master mind. It has been a difficult task for me. I have been at it for thirty years; but to-day I feel as free from the fetters of superstition as I do from the hangman's noose, which is the only comparison that fits the case, in my estimation. The one is as disgraceful to me as the other.

In the beginning was mind.

That mind was law.

That mind is law to-day.

The law is order.

The order is mathematics, and mathematics is represented practically in chemistry and mechanics. The former stands for composition and disintegration; the latter stands for form and motion; the two stand for evolution and revolution.

In chemistry when we combine elements there is a change. Sometimes that change is accomplished peacefully; at other times it is done violently; and there are different stages of violence. This typifies Nature in a finite way and tells us that in accomplishing her purposes some of the evolutions may cause no perceptible disturbance; others are signalized by lightnings and thunder, by cold and heat; still others cause the very bowls of the earth to vomit and change the shape of the surface. In mechanics we see inventions work with such nicety that we render homage to the inventor, yet in a remarkably short time those machines wear out and go to the junk pile. Shall we not take this as indicating that even the planets may disintegrate, and that the shooting stars have been so far reduced as to lose their individuality as this earth may possibly do?

As greater things in nature than mankind reach their limit angles and lose their equilibrium, causing disorder, at least temporarily, it is natural that mankind should pass its limit angles with the same result. Therefore, health is order and disease is simply disorder.

And for the same reason that the man with the stone hatchet framed our theology, the medicine man of the tribes of Israel, or other wild men, founded the dominant system of treating human ills. Both forgot or never conceived the existence of an infinite mind, hence set their own up as the infallible authority. In genetic psychology and neurology we dismiss this as peremptorily as we do the other. We find an explanation of physical ills in the departures from the course indicated by natural laws, and we find a similar explanation of the mental disturbances indicated by fits of temper, melancholy, etc. We know that a nervous system, strained to the point of toleration, exhibits irritation and spasm, and if not assisted in time collapse is the natural sequel; therefore we hold it reasonable that a very small particle of the master mind detached and made semi-independent under the influence of the physical body and the vagaries of other minds may become irritated and if not rescued by the master mind, possibly assisted by other finite minds, will collapse and leave the physical body in an involuntary state or possibly produce its death, which, to my mind, is preferable.

It follows as a logical sequence that the master mind did not create the universe for our amusement; it is possible, even very probable, that these individual atoms of mind may continue in other forms, and while it is really a waste of time which could be otherwise employed better, yet

it does not disturb the order of things if we speculate on the future a little.

As we have reasoned from effects back to cause it only completes the duality which is in evidence everywhere in nature, if we now reason from cause to effect. Man, possessing the higher order of intelligence, and some of these being more highly developed than others, should, naturally, in the next cycle of existence take precedence over their fellow minds as they have in the current sphere; and it occurs to the genetic psychologist that those who have persisted in refusing to open their minds to direct communication with the master mind, thus violating the true order of things, will take subordinate positions in the next existence. Those who have persisted in gods with vengeance in their hearts, and devils in the form of snakes, may take rank higher than the man who organized and manipulates the great Standard Oil system, but we have reason to doubt it, because when that mind reaches the stage where there is no oil or railroad stocks to deal in it will be more readily amenable to the influence of the master mind.

By the same token that those mind atoms now inhabiting human bodies will very likely exist in the future, so should those smaller atoms which now inhabit the beasts and birds; for genetic psychology teaches that all are a part of an infinite system conceived and executed by an infinite mind which we reverence too much to insult by petition of graft or gratitude.

STUDY CAUSES BY EFFECTS.

A Science for Thinking People—The Hope of the Human Race—Ignorance a Crime—Truth a Necessity.

"I honor the man who is willing to sink
 "Half his present repute for the freedom to think;
 "And, having thought, be his cause strong or weak,
 "Will sink t'other half for the freedom to speak,
 "Caring naught for what vengeance the mob has in store,
 "Be that mob the upper ten thousand or lower."

—Lowell.

I acknowledge my obligations to my Creator and James Russell Lowell for the courage to express honest convictions publicly upon subjects which have been hitherto studiously avoided, or discussed privately with bated breath, lest the graven image of Ignorance which obstructs the entrance to the gardens of knowledge of good and evil be shattered, contrary to the desires of a powerful faction which thrives upon credulity, and superstition.

A gullible people applaud the writer or speaker who attacks abuses practiced in the public service; and classes go wild with enthusiasm when the acts or opinions of other classes are criticised.

But, when a common fault is exposed, the inhibitory nerves are

touched, and applause is hushed at the lips of the listeners, for two reasons: First, a consciousness of guilt; second, they are paralyzed by the audacity of the person who dares to beard the Douglas in his hall.

Since the beginning there have been leaders among men, and there has ever been a disposition to take advantage of others. Ignorance and superstition made it comparatively easy for the first leaders to convince the masses they possessed supernatural authority.

These, in their cunning, divided themselves into two classes—spiritual and temporal. The first pretended to have commissions direct from God and proclaimed and anointed the second as rulers of the people. This is the origin of the "divine rights of kings."

The temporal rulers, by way of reciprocity, established laws, in the name of God, and left the punishment for their violation in control of the priests, who took especial delight in inflicting such penalties as kept their victims in constant subjection.

To the ignorant, a priest is one of the essentials of a religion. The more ignorance, the more priests, and the fatter they are.

The ancient leaders, like the modern ones, recognized that the duration of their power depended upon the spread of ignorance, and they proceeded to spread it through the priests.

A few years ago, a Chicago minister abandoned his orthodox flock to teach heterodoxy in one of the down-town theaters, where he failed to secure the financial support he anticipated, and, in his parting address, in the soreness of his heart, he tendered the following corroboration of my assertion. He said:

"It is the hide-bound, orthodox Christian, with a believing sense of hell, who contributes to the support of the church and the ministry."

Then he accepted the presidency of a Klondike-company as a still less precarious means of obtaining his livelihood.

The first laws defined crimes against God and the church, and made the leaders judges, juries and executioners.

The highest crime was "heresy." This to prevent investigation and thought, and such as dared to think and give expression to opinions contrary to the interests of existing authority were immediately put to death. In the name of God!

The same disposition prevails to-day. It is not sufficiently powerful to continue executions, yet church annals are replete with heresy trials and convictions. There are those who would be delighted to carry fagots with which to burn me at the stake for what I am going to say here, and they would sing hosannas to their respective Gods for the opportunity to serve in such a delectable occupation. Yet I shall not utter one syllable inconsistent with morality and honor to infinity and man.

There are some things we know; other we have yet to learn, and others we shall never know.

Some of our knowledge is, inherent, much of it is the result of education, and, unfortunately for the advancement of humanity, one prominent principle of our education has been that we were taught to believe theories advanced by our instructors, and to assert we know that which we have merely accepted on faith. The falsity of that principle is established by the fact that codes, creeds, doctrines, dogmas, theories, have been from time to time subjected to modifications, not so much to conform to the enlightenment of the period, as to save a worthless hulk which would sink into the depths of oblivion at once, were it not for the patches and new coats of paint. They remind me of an Irish sea captain who once related a story of an engagement between a ship (on which he was chief officer) and a whole fleet of vessels, telling how every man swore by the blessed virgin to not surrender the "Mary Jane." After a glowing account of the battle (which lasted several hours, with great destruction on both sides) he admitted his little command was overpowered, when one of his auditors asked, "How about that oath to not surrender the 'Mary Jane?'" "Oh! we fixed that all right," replied the captain, "we changed the name of the boat before lowering our flag."

As education is the most important factor in our lives, it is eminently proper for us to seek the surest method of arriving at the truth, and we must judge proposed methods by the use of that inherent knowledge to which I have referred.

Genetic psychology is the science of reducing the contents of the mind without impairing its functions. In other words, its practice is the art of eliminating from the mind all prejudice, superstition and artificial knowledge, an acquiring information upon lines which conform to the natural state.

The mind is a phenomenon in that it is capable of receiving impressions which educate it to receive other impressions, all of which comprise an aggregation which completely overshadows its inherent qualities, thus converting a really capable mind into a mere receptacle for trash, and, other minds, having been taught in a similar manner, look upon this one as eminently learned, when in truth it is the personification of ignorance. These phenomena, in their natural state, may or may not be identical in all individuals, but their development must be affected largely, by their environments. With so much of the artificial all about, it is not remarkable that the vast majority are lost in its labyrinths.

Our entire system of education has ever had an apparently irresistible tendency toward the mysterious. We have been taught that the more impenetrable the proposition the greater the probability of its being

true, and that which we cannot understand we must reverence because we do not comprehend it.

In illustration of the application of this science, reminding the reader that its practice constantly admonishes its votaries that the work of securing an education is never finished, I will proceed to express convictions which have forced themselves upon my mind through genetic analysis of the subject, and leave it for each of you to put through the same process before concurring with me in the slightest particular.

The ethical code associated with the marriage rite is a gigantic mistake and has made marriage the greatest curse which humanity has been required to endure. It makes woman a slave if she obeys it, and makes her a harlot if she rebels against its inquisitorial provisions. Let us examine it.

According to a common interpretation of the Bible the "forbidden fruit" of which Adam and Eve partook was the consummation of a marriage agreement between them. And, it is recorded that when God happened to pass Eden one day and discovered their happiness, he cursed them, and condemned the woman to suffer the pains of maternity in sorrow.

It seems to have been the "unpardonable sin," too, because her daughters unto the present have suffered in like manner.

The New Testament tells us, however, that there is hope beyond, for it describes two of the principal attractions of heaven, namely, there will be no sorrow there—nor marriage.

It is paradoxical that the custom of marriage as practiced among us derives its authority from the same book which tells us the first marriage was cursed by God.

The priests point with pride to that passage which says: "What God hath joined together, let not man put asunder," and every marriage ceremony they perform is charged to God's account, thus forcing him to assume the responsibility for the mistakes which are made, and denying Him the relief afforded by the courts to humanity on other cases.

They have hedged it about with an alleged moral code, and erected a structure, the corruption bred within which has left indelible blots of licentiousness on the pages of history of every age.

Not content with their own rules of conduct, they have, in modern times, secured the enactment of arbitrary statutes, defining the rights of man and womankind in this particular, and supplemented these by the cultivation of a false idea that there are subjects which are unfit for open expression between the sexes.

The natural product of such a system is libertinism and harlotry, known by its Christian name, free love, which is decried openly and practiced secretly.

The first marriages were accomplished by men merely taking unto themselves wives. It is not recorded that the said wives had any option in the matter, and there was no limit to the number of wives a man might take,—except in the case of Adam.

Later, they selected wives from among women captured from other tribes. Still later they stole them, or entered into athletic contests for them, or murdered husbands, or practiced any other means which suggested itself.

As time passed on, it became necessary that rulers form alliances with each other, so the tribes inter-married by agreement of their rulers, and thus originated the idea of a formal ceremony, a feast in celebration of the event, and a rake-off for the priests.

After this state of affairs had continued for a time, some of the leaders discovered that God's matches were not all that was claimed for them, and they devised the first law to dissolve such contracts.

It was a beauty!

It was called the "Law of Jealousies" and provided that if a husband be jealous of his wife, that she had cohabited with another man, and it was true; or if he be jealous and it was not true, no matter, she was put upon trial by a priest and given bitter water (in other words, poisoned water) to drink, with the injunction that if guilty, the water would cause her belly to swell and her thigh to rot. If she was not guilty, these things would not happen.

The law was ingeniously prepared by the men, so the husband was required to have his wife subjected to this test to absolve himself from the iniquity of which he suspected her, and I have no doubt many good women were murdered through this divinely devilish agency, and the surviving husband was duly pitied and honored. (For particulars, see the fifth chapter of Numbers.)

As the world grew older, brains became more plentiful, the quality improved and more humane instincts prevailed. The "law of divorce" was invented. It provided that "when a man hath taken a wife, and married her, and it come to pass that she find no favor in his eyes, because he hath found some uncleanness in her, then let him write her a bill of divorcement and give it in her hand and send her out of his house." (Deut. xxiv: 1.) That's more like it! Just fire her off the premises! And the law even went so far as to declare that she might, after that, go and become the wife of another man without securing the consent of the one who cast her off. How magnanimous!

I find, in this authority, that it is a disgrace to be murdered by a woman (Judges ix: 45); that she makes a first class burnt offering, witness Jephtha's daughter (Judges xi: 39). That she is a commodity for barter, for, according to Joel iii: 3, "They sold a girl for wine that they

might drink." That she is an outlandish being that has made Solomon sin—that wisest of men who was beloved of his God (Nehemiah xlii: 26); that she is a liar and a deceitful, silly, lustful thing.

But nowhere within the lids of that Bible have I found a word authorizing a woman to steal a husband, or buy one (although I believe they do occasionally purchase dukes and counts and things nowadays), or trade for one, or divorce one, or even put him to the "jealousy test." And I submit it to you, reader, is it fair?

In the practice of his profession, a good doctor seeks the causes of departure from normal physiological conditions and endeavors to assist nature in removing those causes.

No doctor ever cured anyone, and nature has often, to combat not only the disease but the physician.

So it is in the great problem of marriage. Incompatibility is the abnormal condition, and nature revolts at the suggestion of a continuance of such a union. Prejudice and existing statutes are the incompetent physicians, and their prescription. "What God hath joined together, let not man put asunder," only increases the malignity of the affliction.

There are two kinds of incompatibility: Mental and physical. Prospective partners, whose minds are not clouded with romantic notions, ascertain their mental adaptability by association and comparative study of one another. But that code of ethics forbids, as immoral, investigation into the subject of their physical natures, upon a proper adaptation of which depends the future of the world, and they enter the marriage relation blindly, only to learn their mistake after the fetters are forged upon them in the form of a rapidly increasing family.

I have met, in my professional capacity, intelligent women who told me that until after marriage they had always believed that babies came direct from heaven, in the mouths of storks, etc. And I believe them, for, they added tearfully, that if they had known as much before marriage as they know now they would have never formed the alliance.

Under existing conditions, there is one remedy which affords relief. But sensitive natures avail themselves of it only in cases of dire necessity.

The divorce courts are hot-beds of scandal. "Divorce" and "disgrace" are held by the priestly code to be synonymous.

It is not the honorable judges who preside in these courts, but the bodies which enacted the laws establishing the methods of procedure, who are to blame.

If, in the course of ordinary business affairs, a statement is made to you which may have a vital effect upon your calculations, the first thought which arises in your minds refers to the authority for that statement, and, after investigation, you govern yourself accordingly as you find that authority good or bad.

Let us, then, examine the authority for this social condition, and treat it as we find it deserves to be treated.

Originally the Bible was prepared by the Jewish priests and palmed off on their credulous constituents as the word of God. They affirmed that God in person had dictated it to them, and they repeated the story so often they finally came to believe it themselves.

From time to time they added history and dreams until the disruption of the race, which I regard as a fortunate circumstance, else we would now be inflicted with an appalling multiplicity of its nonsense and obscenity.

What evidence have we that the Bible is the word of God? Just the same the Jews had! Nothing but the unsupported word of Moses. And he had a pecuniary interest in the matter.

What evidence have we that the Bible is not the word of God?

First, according to genetic analysis, it is full of inconsistencies, of which a God could not be guilty. It begins by saying that God created all things, thus indicating His power and wisdom, but before the close of the sixth chapter it pictures Him as an utterly incompetent individual as witness Genesis 1: 31, which says:

"And God saw everything that he had made, and behold it was very good." And again in the sixth chapter, verses 6 and 7:

"And it repented the Lord that He had made man on the earth, and it grieved Him at His heart."

"And the Lord said: I will destroy man, whom I have created, from the face of the earth, both man and beast, and the creeping thing and the fowls of the air, for it repenteth Me that I have made them."

Then, it sets forth that Noah was wiser than God, and prevailed upon Him to again alter His intentions, for the next verse says:

"But Noah found grace in the eyes of the Lord," and you all know the rest of the story of the flood which followed the final agreement between them.

Again, after we have been taught that "no adulterer shall enter the kingdom of heaven," we find God sanctioning Abram's relations with Hagar by sending an angel to her with His promise of especial blessing for her and her prospective son, then He appeared in person to Abram, and, without mentioning his fault, gave him the land of Canaan and a new name, "Abraham," signifying that he was to be father of many nations.

Second, the spirit of murder, rapine, licentiousness and general cussedness is its most prominent feature from first to last. Even Jesus is reported in the tenth chapter of Matthew as saying:

"Think not I am come to send peace on earth; I come not to send peace, but a sword."

Third, it teaches there are such things as wizards and witches, and

ghosts, and hobgoblins, and their ilk (and it teaches they'll probably git you if you don't watch out).

It remained for the less devilish romancers and Palmer Cox to discover the good fairies and brownies, the stories of whose wondrous kindness to mortals has filled millions of children's hearts with loving ambitions and taught them: "The true road to perfect happiness is in doing good to others."

Fourth, it accords to woman a place not superior to chattels and this, alone, should condemn it among women.

Do not understand me as denying the existence of an infinite mind. I only repudiate Moses and his co-conspirators. Their stories do not hang together. They are improbable. They are unreasonable. They are impossible. Even in so important a story as the betrayal of Christ, one chronicler says Judas hanged himself. Another says he fell down in a field and burst and his bowls gushed out.

I do not believe there breathes an intelligent man or woman who, upon looking about at the wondrous works of nature, does not feel, instinctively, that an infinite mind conceived and executed the plans of the universe, and who, so feeling, does not reverence such supreme talent as a thing impossible of attainment by mortals.

That infinite mind has been called God, and, with Thomas Paine, I believe in one God and no more.

The idea of a personal God was purely a conceit of man. And, having created God, it was easy to put words in His mouth, or to say certain words had proceeded out of His mouth. And it was, and is still, easy to secure believers by preying upon superstition and misrepresenting that instinctive reverence to which I have referred, promising to the faithful the bribe of heaven, where there will be no sorrow or marriage, and threatening the doubting ones with a scalding lake of molten brimstone, where we shall be compelled to swim around for ever and ever, weeping and wailing and gnashing our teeth, while the Christian God and His chosen few sit on golden benches bespangled with rubies and pearls and enjoy our eternal discomfiture.

In this age of education and opportunity, it is difficult to conceive how anyone can place the slightest claim of a divine inspiration for such a monstrous conception of evil influences and irrational tales. Yet we find so-called eminent scholars who have no hesitancy in saying they believe this earth was created first after heaven, and that all other orbs are mere subordinates to it, having been the products of after-thoughts of the Maker.

Defying astronomical science, they insist that Joshua enforced a command to the sun and moon to stand still a whole day.

The Bible qualifies this story by saying that it never occurred before or since.

They believe Jonah survived three days inside of a whale. And, had the principals been reversed, they would have swallowed the story as readily.

In our ordinary capacity as citizens we are taught to judge our fellow mortals by several reasonable standards.

One class rates their neighbors by the amount of gold or silver and fine raiment they possess.

Another judges by talents, or accomplishments, or honors attained.

And still another forms opinions from a scrutiny of the qualities of mind and heart and the general reputation for respectability—honor, truth and veracity not being the least of the requisite qualifications.

I do not repudiate the self-evident moral precepts of the Bible. It would be sad, indeed, if, in all those pages, we could not find a humane and virtuous sentiment. But I most emphatically defend my God against the charge that He dictated such a guide to iniquity.

The Ten Commandments, for example, are reasonable, but they have been tortured by misrepresentation, according to the social code, so that the only genuine sin is a violation of the Seventh.

This code says virtue consists solely in a strict observance of the Seventh Commandment, and its devotees damn all whom they even suspect of trespass in that particular, and proceed, complacently, to violate the remainder of the decalogue themselves.

The organized exponents of alleged "revealed religions" are to-day, the most conspicuous examples of violation of the First Commandment, in their subserviency to the money kings whose names are prominent on their roll of communicants, as well as at the head of trusts and combinations to control the products of this earth, even literary honors, for their own profit.

This code teaches husbands to suspect their wives and wives to suspect their husbands of infidelity. The Bible gives a history of amours and debauches, which, if it were published under any other title than "Holy Bible," would not be allowed transmission through the mails.

It is not surprising that people continue in ignorance and licentiousness when such powerful influence is brought to bear against investigation and education, and a final knowledge that would emancipate the world from this slavery of blind passion, which has been the curse of so many lives.

It has been said, truly, that example is greater than precept. The commandment says, "Thou shalt not." The history of old says they did,

and the history of to-day says they do. The history of old says Abraham did and was not cast out. The trespassers of to-day say, "We will fare as well as did Abraham."

This code says infidelity of husband to wife, or wife to husband, consists solely in violation of the seventh commandment.

Let us see: "In means "un;" "fidelis" means "faithful." Then, "infidelity" means "unfaithfulness."

Ask the husband who has been sober, industrious, ambitious constantly striving for an independent position for wife and family, who has never had one word of encouragement from her from whom he has a right to expect it; from whom he has received nothing but complaints and criticisms and discouragements, predictions that his efforts would be flat failures, and exultant "I told you so," when they were failures.

Ask the husband whose wife spends her days among the shops or gossiping neighbors, while her children cook their own meals and run wild on the streets.

Ask the husband whose wife is so taken up with church work that she has no time to keep her house in order and see that his meals are prepared and his clothing repaired.

Ask the husband whose wife boasts that she cannot hem a handkerchief or make a loaf of bread, but has been in society since she was fourteen, and was engaged eighteen times before she was twenty years old.

Ask the husband who has all these things and a thousand others to endure, and he will tell you that violation of the seventh commandment is not the whole infidelity.

Ask the little woman who married a man with the drink habit, on his promise of reform, which promise was not kept—they rarely are.

Ask the wife who sits night after night for hours awaiting the coming of him who used to be so promptly on time every evening, with smiles and roses to give her pleasure, and who now comes in wearily from his club at a late hour and asks her to pull his boots off. It's a long way from roses to dirty boots.

Ask the tired mother of a houseful of little ones, who has never passed more than two years of married life without suffering the pains of maternity, and who has all the care of her children, beside a fretful husband, who acts as if she alone is responsible for the incumbrances.

Ask the wife who delights in demonstrations of affection, who in her romantic ignorance married her husband chiefly because of his loving attentions, and now awakens to hear him compare her with a street car which one runs to catch, but, as soon as caught, demonstrations cease. He doesn't mean to insult her. He is a great, big, ignorant boor. But it crushes her heart.

Ask the wife who married expecting to be supported by, instead of

supporting. her husband, and now supplies, by the sweat of her brow, the food which sustains him while he whittles store-boxes and talks politics.

Ask the wife who has all these and greater ills to suffer, if she thinks violation of the seventh commandment is the only act of unfaithfulness in married life.

This code, born in iniquitous minds, reared in licentious hearts, clothed in a mantle of alleged inspiration of God, stalks the world to-day, as it has for ages, overshadowing truths that God intended all to know, namely: That mental and physical adaptability are two distinct propositions. That to be mated happily a couple must possess both at once.

This falsely called virtuous code, which breeds more unvirtue than anything else on earth, tells us to trust to luck in choosing our mates. It educates society to read trashy romances of sensational elopements and sensual escapades, and then go and do likewise.

Science teaches us to use common sense in contracting marriage, just as we would in any other business engagement, and ascertain, by honorable means, the truth regarding our comparative fitness for each other.

Shakespeare discounts the ten commandments when, in Hamlet, he makes Polonius advise Laertes:

"This above all: to thine own self be true,

"And it must follow, as the night the day,

"Thou canst not, then, be false to any man."

We are all God's creatures, and if we learn to be, and are, true to ourselves, we cannot be false to others nor to Him.

If the first marriage was a sin, all subsequent ones have been.

If God joined the later ones together, He committed a crime upon the occasion of each marriage celebration.

If he did not join them together, somebody has lied.

I do not believe marriage is a sin, per se. It is only a deplorable mistake in most cases.

In some it is a real benediction.

I believe it is a sin worse than adultery for a marital union to be continued after the discovery is made that there was an error committed in the formation of that union.

I do not believe the Bible is the word of God, because it conveys the idea that Adam and Eve sinned in cohabiting, when cohabitation is the only means of perpetuating and ennobling our race.

I do not believe the Bible is the word of God, because it does not recognize in woman man's equal. The place she is making for herself in the world to-day proves the falsity of its assumption.

I spurn the book which tells me woman was, in any age, contraband of war among God's own people.

I refuse to believe that a soul is lost because it was born out of wedlock. It was begotten in a natural manner, and is a child of the God who devised the method of procreation.

I denounce the social code which ostracises the unfortunate girl who gave herself up to her lover, and continues to receive her seducer at its functions.

I lay at the doors of Christian society the charge that it is more unclean than the girl who satisfied, in a natural manner, a passion which an all-wise God gave her.

I say there is nothing more blasphemous nor deserving of contempt than the prevailing idea that the function of the procreative organs is a topic unfit for discussion between the sexes.

I insist that ignorance is a crime, and that those who seek to restrict the dissemination of knowledge (good or evil) are criminals.

How are we to avoid evil if it has not been exposed to us?

I deny that mankind is naturally prone to evil, but admit that our education for ages has drifted us that way, and I hold the bible and Christianity responsible for it.

Mankind was created male and female for the purpose of cohabitation, procreation and pleasurable companionship, and all were created equal so far as the rights subject to their control are concerned.

Marriage, as it is practiced, is a desecration of those rights.

Rev. Charles H. Parkhurst, who, posing as a reformer, created a disturbance in New York a few years ago, delivered an address in Madison Square Presbyterian Church, in which he said:

"I do not know how many unfaithful husbands or wives there are in this community, but I should calculate that there might be well on toward a quarter of a million.

"The love between husband and wife is kept true, in some cases, by the possession of children; but I have learned enough to know that in the case of any couple that might present themselves before me to be married, I would not, at any rate of premium, issue an insurance policy on their conjugal felicity good for more than five years, unless on the contingency of offspring, or on the basis of their common faith in God.

"Educating a man does not change his impulses any more than whetting steel converts it into willow, or sharpening a wolf's teeth will make him a kitten."

Just think of it, you!

Just think of a system, the practical workings of which bring such expressions from one who believes in it!

Could anything be more sweeping in its condemnation than his own statement that he would not issue insurance guaranteeing conjugal felici-

ty for more than five years to those whose union he officially pronounced the work of God?

He says education does not change one's impulses.

Maybe it did not in his case, in which event we can understand better his object in his slumming experiences.

I think he is right in his estimate of the unfaithful ones. Probably it is too low. But who is responsible for it?

He asserts the love between husband and wife is kept true, in some cases, by the possession of children. In others, by a common faith in God.

Some of the most unhappy families I have ever seen had as many children as the famous old woman who lived in a shoe, and they had family prayers twice a day, beside "grace" at meal time.

The moderately happy ones whom I have known were invariably rather lax than otherwise in their religious duties, and appeared to live more for the present happiness than for the hereafter.

The idea of "keeping love true" could only find lodgment in a diseased brain or undeveloped mind.

True love will always remain true, children or no children, Christian God or no Christian God, marriage or no marriage.

The spurious article, propagated in the hot-houses of romance, may need a superstition, a ritual and houseful of responsibilities to sustain it.

The genuine, that inherent sense by which one feels the object of his love is a part of his being, supports itself. It is God, and God is love. It controls passion. It inspires ambition. It exalts the mind. It purifies the soul. It is good. Let us revere it.

Some of our good brethren, the preachers, tell us, from their pulpits, the world is growing worse. Others, realizing who and what will be held responsible for this condition by thinking people, loudly proclaim from their pulpits that the reverse is true.

They dispute about the fatherhood of God and the brotherhood of man until both are exhausted and neither convinced. They have not learned the difference between a dispute and an argument. When one proposes a great reform, the other opposes it, not with argument, but from pure love of dispute.

I believe the world is growing better. There appears to be an increasing desire for knowledge. And with knowledge comes a desire to use it. That desire forces the individual to seek associates who can appreciate him or her. And, when people engage in the pursuit or dissemination of knowledge, they are not getting into mischief.

One of the subjects to which a great deal of study is now being devoted is the physical adaptability of mankind and womankind. It is

being discovered that we are different from animals. That we have greater opportunities to improve our race than the animal. We have the examples of what breeding and cultivation have done among animals and in the vegetable and floral kingdoms. And it is beginning to dawn on students that we owe it to our Creator and ourselves to continue the development of our race.

Animals have passions, which are governed by instinct. The human family have passions, and most of them are governed by instinct; the rest by superstition, except a very small proportion who rule their passions by the use of the mind which God gave them to make them superior to the beasts of the field.

They have learned that one passion is periodical in animals and almost constant in mankind. They have reasoned that the Creator gave these passions to bring affinities together for the purpose of perpetuation and elevating the race. They have found that gratification of those passions is the sweetest of the fleeting pleasures God has given us. They reasoned that He did not intend procreation to occur as often as the passion obtained, because it is impossible, and discovered that the power of the mind could be used to control those passions, regulate procreation, and promote happiness.

They formed themselves into communities and conducted experiments which, in the one instance I have investigated, covered a period of thirty-seven years of successful demonstration of a physical principle which all the creeds and creeds of all the priests and prudes in Christendom cannot gainsay.

I do not advocate their community plan, nor do I condemn it, except in one particular. It was established as a church.

I believe in their principles as a science and do not want any church business mixed with it.

I do not advocate the promiscuity which obtained there, because it would be abused in the present degree of enlightenment, and I believe, anyhow, that when a couple are deliberately, intelligently, scientifically mated to each other, and know it, they will have no desire for other company.

At the same time, I maintain that were the general public educated up to and practiced the beliefs of that community, all men would be honorable, all women would be virtuous. There would be no libertines and no harlots.

That community was sacrificed on the altar of superstition at the seat of government of the great state of New York by its legislature under the leadership of a minister of one of these "revealed religions" of which Abraham, David and all the old kings were the founders.

I presume he had a vision in which he saw a handwriting on the wall,

but, by his interpretation of it, he put off the evil day of his dethronement by securing the enactment of a law making statutory criminals of a people whose religion was to do good and whose history, moral, physical and financial, affords an example worthy of emulation by indigent swaggers who set themselves up as teachers and critics of their fellow mortals.

They suffered the distinction of persecution, as did Jesus Christ, Martin Luther, Thomas Paine, and others whose works will endure and command admiration as long as the earth continues to be inhabited.

Jesus Christ taught, "Do unto others as you would have them do unto you."

Martin Luther taught the confessional was a snare and delusion conceived by the priesthood and employed to extort money from the laity, who purchased "indulgences" for contemplated crimes. By order of the Pope his writings were burned, but he retaliated by destroying publicly the pope's bull against him, thus throwing down the gauntlet for a combat which resulted disastrously to the idea of exclusive papal authority.

Thomas Paine, while in prison for uttering sentiments contrary to the beliefs of existing fanatical authority prepared for the world his "Age of Reason," which has, more than any other book published, taught mankind how to think, how to distinguish between true and false propositions.

Galileo discovered and taught a system of planetary evolutions which the wise men of the church declared was contrary to the teachings of the Bible, and they put him to the torture.

Galileo was right and the priests wrong again.

I would not limit the dispensation of information, upon any subject, to the membership of a community, of a church, or of a lodge. I would scorn to pursue investigations in any direction in a manner which I would be unwilling to trust others to follow, or to travel a road where my fellow mortals would accompany me at their peril.

I want to express opinions as I form them, so that if my conclusions are right others may be stimulated to study, and if I am mistaken I may be set right by those whose mental development is superior. The mind which would inspire imprisonment and persecution as my portion for thinking and giving expression to honest thoughts is beneath my contempt, and is a monstrosity which must be a humiliating spectacle to its Creator.

When one is studying from a natural point of view, everyday expressions often suggest ideas. Recently the words "indecent exposure of person" touched my mind, and I investigated the idea with the purpose of understanding its full significance.

To the mind in a very low state of development it suggests sensual thoughts. To the one superficially developed it awakens feelings of disgust. In the genetic mind it inspires investigation as to what would constitute indecency, supposing no ordinances upon the subject existed.

If the Creator intended us to wear clothing for the purpose of concealing any portion of our anatomy, he committed a flagrant breach of duty in neglecting to arrange that we might be born clothed.

As he did not so provide, and as the amount of clothing worn in various climates ranges from a smile and a fan in the torrid zone to polar bear skins in the Arctic regions, we are compelled to charge the clothing feature to circumstances, and the amount and variety of fashions to the ingenuity of mankind.

The regulations of society regarding the amount to be worn are purely matters of education and that education is, in this instance, evidence of society's erotic condition.

I saw a picture, in a Sunday paper, not long since, of an elegantly dressed gentleman ogling the shapely ankle of a young girl who was crossing the street holding her skirts out of the mud with one hand, while she carried an umbrella in the other. The gentleman's comment was: "Gee whiz! that is the most beautiful ankle I have ever seen." At that moment the girl reached the sidewalk and he recognized her as his own daughter. Then he expressed himself as follows: "Ethel, you ought to be ashamed to expose yourself so; you are a disgrace to your family."

Now, I say that man, in all reason, should have been arrested and fined heavily for exposing his mind.

If an individual is diseased in any part of his or her anatomy, nature requires exclusion from exposure to the elements in order that the healing process may continue unhampered. Bodily infirmities affect the sensibilities of different people in different ways; therefore a diseased part should be covered.

In the instance of the gentleman mentioned above, I think a gag in his mouth would have covered effectually his mind, which was evidently diseased.

To the pure all things are pure. To the mind which has been filled with false doctrines, the naked form of a Venus or Apollo, sculptured in marble, is an indecent exposure of person.

Thousands of people in this city will not visit the Art Institute for fear of assault by some of the statuary there. And I think it is just as well that they remain away. Their souls are too shriveled to appreciate the beauties of such a garden of the gods.

I know people who will not sing "The Campbells Are Coming" in company because the tune has been applied to some lewd verse. My polite vocabulary fails me when I try to express my opinion of such prudery.

The education which keeps the young in ignorance of their natural functions and how to care for them makes invalids and harlots and outcasts of the girls, and libertines and criminals and physical wrecks of the boys.

I would educate them all in every direction which will enable them to promote their own physical and mental development.

I would teach them that God never made anything that He is unwilling His children should investigate.

I would teach them all that when the authors of the church code suggest that there is a forbidden topic, they do it with a deliberate intention of stirring up such evil thoughts as reigned supreme in the minds of the old reprobates who wrote the Bible and in it taught the doctrine, "Though thy sins be as scarlet thou shalt be whiter than snow," thus putting a premium on sin and fixing it so one who believes their plan can sin in detail and be forgiven in job lots.

I would teach the young man to respect womankind from the sheer force of his intellect. I would also teach him that hell is the remorse an honorable man suffers when he has wronged anyone, more particularly a woman, whom Nature endowed him to protect. I would teach him that heaven is the loving confidence a sweet girl reposes in a manly man, and that the more manly he is the more confidence she will give, and the more Heaven there will be for both.

I would teach the young woman to cultivate common sense, that she may distinguish the true from the false. I would educate her to a realization of the responsibilities which will come to her in the marriage relation, so that if she does not choose to assume such a burden she can decline to enter into the contract.

I would teach them both, with reference to the marriage contract, that woman is in all respects man's equal, and should have the privilege of determining whether or not she will endure the pains of maternity.

The man must understand that he is her protector, and should qualify himself with a scientific knowledge of his duties and how to perform them, before he presumes to enter the marriage relation.

Children should be prearranged for and the mental and physical temperaments should be in harmony to develop the race. It is a crime to do otherwise.

I would teach them to limit their family to their ability to provide food, clothes and education. Not by criminal practices, but by the light of higher knowledge and in manners consistent with Nature, and health and happiness.

I would teach them that none are perfect, that mistakes in the selection of life companions are liable to occur even under the best conditions, and if, after marriage, they discover an error has been committed, they should dissolve their relation before incumbrances arrive. The products of their union could not be valuable acquisitions to society.

Finally, I would teach everybody to have a supreme contempt for idiotic conventionalities and a hearty respect for God's truth and justice,

and to do right as their enlightened minds see the right, because it is right, and not through any superstitious fear of God, man or devil.

MENTAL DISEASES.

Many are Such which Have not Been so Considered.

These are of two kinds: First, from natural causes, such as shock or strain; second, educational causes, which are the most baneful, for two reasons: First, they controvert nature and are practically incurable because of the many chances for reinfection, and even moderate attacks have such complete control of the victims, through an alleged moral code, that they refuse to listen to reason and let their physical bodies suffer untold ills, which in themselves should be reason enough for changes of opinion; second, although they are dangerous to the welfare of the communities in which they live, they are permitted to run at large, unless they reach a state of frenzy where they are liable to do themselves or others bodily injury as the consummation of their fanaticism. Many of this class are really estimable people in all particulars except that they would invoke the aid of the legislative and judicial machinery in order to realize their dreams. The more rational class in all communities who have given the matter a second thought, have for ages pointed out the fact that the so-called dogmas violated every law of nature by teaching mankind that there are subjects unfit for conversation between the sexes and that there are parts of the human anatomy of which the owner should be ashamed. The rational thinkers have taught that the part to be ashamed of is the perverted mind that insults its creator by shaming his works, because in the ignorance, cultivated by the other class, some organs have been misused and polluted.

The first class of cases is divided into acute mania and melancholia, or what we term the + and — stages. They are frequently found on the midline between the two extremes, for the reason that a perfect mind cannot exist in an unhealthy body, because it derives its sustenance from the same food that the body does, while its development depends upon its unrestricted right to think and express its thoughts in exchange for those of others. Thus, it will be seen immediately that in all cases of mental derangements from physical causes we also have to contend with the influences of education, both proper and improper.

The first exhibit of mental disorder, from physical cause, is usually dullness of understanding. The second is excitability, irritability of temper, etc., The third is loss of memory. The fourth is the extreme products, mania on the up turn and melancholy on the down turn. These conditions are often aggravated by lack of discretion on the part of the doctor or the friends of the patient. Some people require sympathy, others require castigation. Too much sympathy is depressing; not enough has pushed many a victim over the danger line into acute mania or total collapse. It is very often necessary to isolate the patient from relatives and friends, and too

often the trained nurse is an automatic devil, absolutely devoid of judgment or sympathy, who treats every case alike, regardless of temperament or physical condition. A perfect nurse is a born doctor, with the complement of an education in the practical use of common sense. A good doctor is a born nurse, with the addition of his education. Not one woman in ten thousand is fit for either. This may be from the environments which have been hers from the beginning, or it may be an inherent truth, but it is nevertheless true, a female physician is either too mannish to have an attractive personality, or she is too excitable and conscious of the superiority she believes she possesses over her fellow citizens.

Results which came from physical causes will naturally disappear when those causes are removed, always provided that the secondary have not gained supremacy in the meantime.

Of the other class we have a great diversity in the effects. In the first place, selfishness is naturally and properly the greatest attribute of human character. Utilized properly it fosters ambition, inspires desire for education that its possessor may understand how to get the most good out of life without infringing upon the rights of others. It concedes to others all privileges consistent with the natural laws of order and fairness. It disputes the right of any to a monopoly of either thought or action. It disdains to accept the aid of statutes to secure unjust privileges to itself. It is, without question, the highest type of development of the human intellect. If allowed to pass the "limit angle" it becomes a mental disease and the one form of insanity which has done more harm than all other causes, physical or mental. Its name is jealousy. It has been classified appropriately as the "green-eyed monster;" its chief ally is conceit, which is simply self-esteem gone beyond the limit angle. It is suspicious. It is ignorant. With it, to imagine is to believe, to believe is to act, to act is scandal and scandal is hell. It has no regard for character. It sees but one idea. A thousand virtuous acts are forgotten in the presence of an imaginary misstep. It has made marriage a humbug. It has driven men and women to crime. It has smashed homes, lodges, churches and governments. It has stuck its vile head up in the name of christianity and burned alleged heretics at the stake. It crucified Jesus Christ. It has appeared again in modern times, in the form of medical legislation, and declared that those who practice the methods of Hippocrates with scarcely any improvements since his time, not only shall have the exclusive right to attempt to relieve human suffering but shall have the exclusive right to lie about it and profess to heal and cure, when any sane person knows that only nature heals and cures and that the best any doctor can do is to assist her by removing the physical causes with appliances, manual treatments, dietetics and hygiene, and seek to educate his patients mentally to prevent the infection of the mind by bigots and charlatans, who by reason of their numbers, have been able to

make the masses believe they are the only legitimate thinkers and practitioners.

Another branch is the terrible scourge from the bacillus "goldbug." The prophet said "The love of money is the root of all evil." He was mistaken, as we have just shown, but it certainly ranks second in importance because our legislatures and courts have shown a subserviency to the medical and other trusts by passing alleged laws and upholding them, which have denied the people the rights guaranteed by the constitution, which says, "The rights of citizens of the United States shall not be abridged." They do this when they declare that the old-school medical doctors shall have the only rights to treat human ills, and the public, which is the great sufferer, proves its contempt for such alleged laws by employing "irregular" doctors with new and improved methods as positively harmless as they are positively drugless, and getting good results where the unconstitutionally protected ones fail. We can show conclusively in exact figures, the importance of the eyes as factors in causing human ills. We can prove absolutely that the habits of eating, etc., are common causes of physical ills, and we can show many others which we defy drugs, surgical operations as commonly understood, osteopathy, chiroprathy or any one idea system to benefit the slightest. Neurology teaches the rights of man. It teaches the limitations of selfishness and its practitioners, who have no yellow streaks in them, defy the alleged laws and invite the public to avail themselves of their own constitutional rights to get health wherever they can find it, and to assure them that we have the only air line road to Wellville, but that when they buy a ticket, they must be sure to remain on the train or they will never get there. By this we mean that they must follow instructions to the letter; otherwise, while they may reach there eventually, they will have gone on a way freight instead of on the "twentieth century limited."

The effects exhibited by our patients, in the mental departments, are sometimes obstacles to our methods. For example, pork, especially ham, well cooked, contains a fine proportion of certain elements which we find by our analysis nature needs. The Jew has religious scruples against this meat, but we can be magnanimous with this mild form of insanity by substituting fish and chicken.

Another form which we find very common, is that it is difficult with female patients to get the full story of their physical ills because of a prudishness which has been cultivated in them by well-meaning mothers and others, the result of which is to keep them in ignorance regarding their anatomy and physiology and to propagate a vague idea that to even think of their sexual organs is lewd. The result upon the doctor is that he has to grope along in ignorance or dismiss the case for the insult to his manhood and education. Happily neurology offers the nearest solution of the diffi-

culty that is possible. Whenever we find such insanity we demand absolute rest, strict obedience to the letter of instructions, see the case at least every other day, and if we find violations, we quit the case to save a reputation which would otherwise be injured through no fault of our own.

The public expects little or nothing in chronic cases from the old drug methods, and though they go from one doctor to another through several years of exactly the same kind of treatment they have no fault to find with the old systems, but jump upon ours with both feet and a club without waiting to find out what it is, which is certainly an acute form of insanity, and if they finally decide to try our methods, and are not marvels of health and beauty in forty-eight hours, they condemn us. Right here, we are liable to attacks of the disease ourselves. We get such marvelous results, as a rule, by conceding to Nature all the powers of cure, and being careful to assist her but never to supplant her, that we are apt to promise too much in order to reach the educational cause of the trouble, we crowd the physical possibilities into too short a time, thus contributing to our own undoing. Therefore we must watch ourselves as closely as the patient watches us, in order to keep within the laws of reason because their violation has a penalty attached that no state board nor venal judge nor state legislature nor jailer can enforce.

One of the bad forms of insanity is that in which the patient has become so attached to her ills that it grieves her to part with them, and who, when she finds herself getting well, deliberately abandons treatment, assuming that she is well, without consulting the doctor and goes back into the old state and then blames the system. For such, a handy vocabulary of cuss-words is a valuable addition to the doctor's armamentarium.

The blame for the species of insanity that makes patients expect to violate nature's laws and purchase immediate immunity from the doctor without any sacrifice on their part, as they purchase immunity from punishment for alleged spiritual sins at the confessional, is directly due to the doctors themselves, but indirectly to the public and primarily to the priesthood, who in ancient times were not only spiritual but temporal authorities. The bible teaches that Elisha, the apostles and others performed miracles in curing diseases. The people came to believe this rot and demand that the present day doctors furnish a magic substitute for the penalty of the violation of all natural laws, so that they may indulge their insane desires with impunity. One of them walks into the doctor's office suffering from an acute disorder, looks the doctor squarely in the eye, while he deliberately asserts that he has done nothing to merit the punishment he is receiving, demands a medicine that will cure him while he continues the irritating cause; the doctor, inherently honest, knows his patient is a liar and a fool, but he also knows he is only one of many and instead of refusing to touch the case, except under his own conditions, he accedes to the patient's de-

mands so far as giving the dope is concerned, although he knows it cannot work, even were it a specific, because the patient will not give it a chance. At first the doctors were forced to do this or starve, because there were always dishonest ones who would take chances. At first it was a criminal form of insanity on the part of the doctors, but now it is only a passive form due to ignorance and custom. Every old school doctor knows this to be true. We want the neurologist to eradicate this form of insanity in his own ranks, if it exists, by a rugged honesty with himself and his patient and help knock it out of the others by going directly to the cause; in short, educate the people.

Alleged dietaries, fads of hot and cold water, patent medicine claims and other minor classes of insanity are all put under one heading called, "idiosyncrasies."

One of the classes we have to combat comprises those with what they call a conscience. Their trouble has assumed such a keen form that they insist they must continue their self-imposed missionary duties, even though broken in health, but they demand that we render relief anyhow. About the best dose for it is, "You pay me too high a compliment: you assume that God can't run his business without your help, but that I can, thus you make me greater than God, which is conclusive proof that you are crazy."

Another form is that which is produced by unnatural physical causes, such as operations. Statistics of castrated women show that 78 per cent suffered notable loss of memory; 60 per cent flashes of heat and vertigo; 50 per cent became more irritable; 42 per cent suffered mental depression; 10 per cent verged upon melancholia; in 75 per cent diminution of sexual desire; in a few cases there was sexual hyper-excitability; 12 per cent noted a change in their voice; 15 per cent suffered irregular attacks of skin diseases; 25 per cent had headaches; 5 per cent insomnia. The mental effects as well as the physical ones will nearly always yield to our methods, but in all reason it must take longer than if the patient were all present or complete. The exhibit of insanity in such cases is that with sections of them scattered about the country, promiscuously, they expect miracles of us.

Neurology is not a miracle business. It is not a faith cure. It is not a dope cure. It is not a man cure. It is simply a method of rational practice, requiring an accurate knowledge of the chemistry and mechanics of the human body, what it subsists upon, the laws of physics and the ability to use them in analyzing cases and finding the causes of human ills. The patient does the treating and Nature does the curing. The neurologist bosses the job and gets the fee, and he gets a good one, or he is crazy.

Applause is sounding brass and hollow barrels. Those who clap the loudest at the conclusion of a song are invariably those who conversed incessantly during its rendition.

QUIZ.

1. What is metaphysics?
2. What is logic?
3. What is dogmatism?
4. What is psychology?
5. What is genesis?
6. What is orthodoxy?
7. What is heterodoxy?
8. What is heresy?
9. What is an idea?
10. What is theory?
11. What is mind?
12. What is knowledge?
13. What is learning?
14. What is erudition?
15. What is education?
16. What is language?
17. What is theology?
18. What is sociology?
19. What is politics?
20. What is law?
21. What are statutes?
22. What is theosophy?
23. Which is greatest, Christian God or Christian devil?
24. What is anatomy?
25. What is physiology?
26. What is histology?
27. What is the chief duality of the brain?
28. What are the four grand divisions of the brain?
29. What are the two grand divisions of the nerves?
30. What are the two sources of nerve supply?
31. What are the two grand functions of nerves?
32. What are some subdivisions?
33. What is the duality of lung function?
34. Which lung is the largest, and why?
35. What are the grand divisions of the heart?
36. What are the valves of the heart?
37. What is the duality of the circulatory system?
38. What is meant by the pulmonary system?
39. What is the systemic circulation?
40. What is the portal system?
41. What is the lymphatic system?
42. What are lacteals?

43. What are the mesenteries?
44. What are ganglia?
45. What are plexuses?
46. What are commissures?
47. What is the function of the spleen?
48. What is the function of the pancreas?
49. What is the function of the stomach?
50. What is the function of the liver?
51. What are the functions of the kidneys?
52. What are the functions of the supra renal capsules?
53. What are the functions of the intestines?
54. What does the abdominal cavity contain?
55. What does the thoracic cavity contain?
56. How does the stomach perform its function?
57. What is ingestion?
58. What is digestion?
59. What is assimilation?
60. What is congestion?
61. What is osmosis?
62. What is anastomosis?
63. What is urea?
64. What is uric acid?
65. What is albumen?
66. What is carbon dioxide?
67. What constitutes the alimentary canal?
68. What is the difference between muscles and ligaments?
69. What are tendons?
70. What are ligaments?
71. To what structures are muscles attached?
72. How many lobes has the liver?
73. What is a peculiarity of the spleen?
74. Where is the thyroid gland?
75. Where is the thymus gland?
76. How many cervical vertebrae are there?
77. How many dorsal?
78. How many lumbar?
79. How many sacral?
80. How many coccygeal?
81. What is the atlas?
82. What is the axis?
83. What muscles operate the tongue?
84. How many bones in the body?
85. What are the viscera?

86. What are the pleurae?
87. What is the pericardium?
88. What is the periosteum?
89. What is the peritoneum?
90. What is the perineum?
91. What is the endocardium?
92. What are the principal arteries?
93. What is the innominate artery?
94. What are the principal veins?
95. What are the regions of the abdomen?
96. What are the bones of the ear?
97. How can the portal veins be known from the hepatics when the liver is opened?
98. What is a gauge?
99. What is neurology?
100. What is a dynamic test?
101. What is a static test?
102. What is accommodation?
103. What is convergence?
104. What is co-ordination?
105. What is inco-ordination?
106. What is a sphincter muscle?
107. How many layers form the eye?
108. How many layers in the retina?
109. Where is Schlemm's canal?
110. Where is Jacob's membrane?
111. Where is the zone of Zinn?
112. Where is Muller's muscle?
113. What is the uveal tract?
114. What are tunics of the eye?
115. What is the macula lutea?
116. What is the visual axis?
117. What is the tunica vaginalis?
118. Where is the capsule of Bonnet?
119. Where is the capsule of Tenon?
120. How many layers in the cornea?
121. What is the index of refraction of the eye?
122. Where is Bowman's muscle?
123. Where is Descemet's membrane?
124. Where is Dollinger's band?
125. What does hyaloid mean?
126. What does vitreous mean?
127. Where is Pettit's canal?

128. How many muscles has each eye?
129. What are the optic thalami?
130. What are the corpora geniculata?
131. What are corpora quadrigemina?
132. What is the optic commissure?
133. What are tautomina oculi?
134. Where are the lachrymal glands?
135. What is the ciliary body?
136. What is the corpus callosum?
137. What is natural philosophy?
138. What is physics?
139. What is force?
140. What is light?
141. What is density?
142. What is refraction of light?
143. What is an index of refraction?
144. What is reflection of light?
145. Of what value is reflection?
146. What is dispersion?
147. What is absorption?
148. What is a ray of light?
149. What is a beam of light?
150. What is a pencil of light?
151. Where does refraction occur?
152. How does it occur?
153. What is a horizontal?
154. What is a vertical?
155. What is a perpendicular?
156. What is an oblique?
157. What is a parallel?
158. What is an incident ray?
159. What is a reflected ray?
160. What is a refracted ray?
161. What is an emergent ray?
162. What are the angles of the four above named?
163. What two things regulate the amount of refraction?
164. What is the first law of refraction?
165. What is the limit angle of refraction?
166. What important lesson does it teach?
167. What is a prism?
168. What is the first law of prisms?
169. What is the second law of prisms?
170. How are prisms utilized in forming lenses?

171. How many kinds of lenses are there?
172. Describe the axes of lenses?
173. What is meant by the focus of a lens?
174. How many focuses has a lens?
175. What are the differences between them?
176. What are the principal points and planes of a lens?
177. What is a radius?
178. What is a diameter?
179. What is a nodal-point?
180. How many has a lens?
181. What is a toric lens?
182. What is chromatic aberration?
183. What is spherical aberration?
184. What is an achromatic lens?
185. What is an aplanatic lens?
186. What is an astigmatic lens?
187. What is a spherо-cylindrical lens?
188. What is a cylindrical lens?
189. Explain the differences between prisms, spheres, cylinders, etc.
190. What is the relation between density of mediums and rate of speed at which rays travel?
191. What is the difference between the radius of a plano convex lens and a bi-convex of the same power?
192. The focus and index being given how shall we find the radius of curvature necessary?
193. The focus and radius being given how shall we find the index?
194. The radius and index being given how shall we find the focus?
195. What is a lenticular lens?
196. How does a + sphere form images?
197. How does a — sphere form images?
198. What is meant by a virtual image?
199. Why are images always inverted if formed by a single dioptric system?
200. What is a double dioptric system?
201. Why do we take air as our standard of refraction?
202. What is the index of air compared with glass, the latter being regarded as the standard?
203. How many ways are there of finding the conjugate foci of a lens?
204. What lesson is thus taught?
205. How far from a lens must an object be placed in order that its image will be as large as the object?
206. What is the meaning of the word diopter?
207. What does it represent as commonly used?

208. What is a No. 1.00 lens?
209. What is a meter?
210. If an object be placed 26 inches from a + 4.00 lens where will the image be? Why?
211. If an image is 10 inches from a + 5.00 lens where is the object?
212. If an object is 32 inches from a lens and the image is 12 inches on the other side how strong is the lens?
213. What is a meniscus lens?
214. What chemical class does glass belong to?
215. What is the difference between transposing prescriptions and neutralizing lenses?
216. What is a meridian?
217. What geometric duality is utilized in lenses?
218. How would you convert a pair of cross-cylinders into a spherocylinder if the axes were not at right angles to each other?
219. What is the difference between a cross-cylinder and a spherocylinder lens?
220. What would be the effect of refraction upon rays starting from a point nearer to a lens than its principal focus?
221. What is the effect on objects seen through a + lens if the object is beyond a conjugate focus with the eyes?
222. What lesson is taught?
223. How does light travel?
224. What are constants?
225. What are inconstants?
226. What are laws?
227. What are rules?
228. What is the optical center of a lens?
229. What is a decentered lens?
230. Why does a — curvature focus at one-fourth of its focal length?
231. How may we measure a compound lens with out a lens measure or test lenses?
232. What is diffraction?
233. What is refrangibility?
234. Transpose + 2.00 — 1.00 ax. 180 to simplest form.
235. Transpose + 1.50 — 1.50 ax. 140 to simplest form.
236. Transpose + 1.50 — 2.00 ax. 45 to simplest form.
237. Transpose + 1.50 ax 90 $\odot$ + 1.50 ax 180 to simplest form.
238. Transpose + 1.50 ax 45 $\odot$ — 3.00 ax 135 to spherocyl.
239. Transpose + 1.50 + 1.50 ax 90 so the signs will differ.
- 240... Transpose — 2.00 — 5.00 ax 180 so signs will differ.
241. What are the principal meridians of a lens ground from the following prescription: + 1.50 ax 45 — 2.50 ax 15?

242. What sphero-cylinder will have same effect?
243. Neutralize $+ 3.00$ ax 180° $\ominus$ $- 4.00$ ax 45° and give sphero-cylinder that does it.
244. What sphero-cylinder would have same effect as above cross cylinder?
245. The glasses needed in a case are L, $+ 1.75 + .50$ ax 90° ; R, $+ 2.00 + 1.00$ ax 45° . An optician gave L, $+ 1.00 - 1.00$ ax 180° ; R, $+ 1.50 - .50$ ax 135° . How far wrong was he?
246. Another case needed L, $-.75 + 2.50$ ax 180° ; R, $- 1.00 + 3.00$ ax 90° . Was given by an oculist, L, $- 1.50 - 1.50$ ax 90° ; R, $- 2.00$ ax 90° . What would correct his mistake?
247. Transpose $+ 12.00 + 3.00$ ax 90° to a toric.
248. Transpose $- 6.00 + 11.00$ ax 90° to a cross cylinder.
249. Transpose $+ 2.00 + 2.00 + 2.00$ ax 45° into a sphero-cylinder.
250. Why is it that cross cylinders can always be duplicated by sphero-cylinders even if the axes are not at right angles?
251. How many kinds of natural light are there, name them?
252. What is spasm?
253. How may we classify them?
254. What class is most common?
255. What are the extremes physiologically?
256. What are their peculiarities respectively?
257. Under what circumstances would you prescribe spherical $+$ lenses.
258. Under what circumstances would you prescribe spheres permanently when the test demanded a compound?
259. When would you prescribe a cylinder if the test showed a compound error?
260. When would you prescribe compounds if the test demanded simply cylinders?
261. When would you prescribe $+$ lenses if the test showed myopia?
262. How often should the normal heart beat?
263. How often should respiration occur?
264. If the heart misses beats what is indicated?
265. Does age have any influence in determining what to do for a patient?
266. What are idiosyncrasies?
267. What is the true "fogging" system?
268. Under what circumstances would you guarantee good results?
269. Why would you not guarantee a case if the patient requested it?
270. How should fees be collected and why?

271. How would you meet the objection that patient did not want to pay or could not pay until work was done?

272. If a case, measured, showed a preponderance of symptoms, indicating the necessity for rest from usual avocation and patient said he could not comply with the requirement, what would you do and why?

273. Suppose a patient applied to you to correct his eye defects and he would risk the rest, what would you do?

Most devilish—jealousy.

Most popular—applause.

Most dangerous—flattery.

Most truthful—a mirror.

Most plentiful—ignorance.

Most annoying—carelessness.

Most disgusting—affectation.

Most foolish—to think it fools folks.

In the half circle from 0 to 180, Fig. A, are 648,000 seconds. Refraction of oblique rays of light by glass is limited to an angle of about fifty degrees on either side of the perpendicular, so that a ray, approaching the surface of glass obliquely below the 40th or 140th meridian suffers total reflection. Therefore, if the 360,000 seconds in the 100 degrees between these two meridians each represented a ray, only one would pass through without refraction, viz.: the one on the line marked 90.

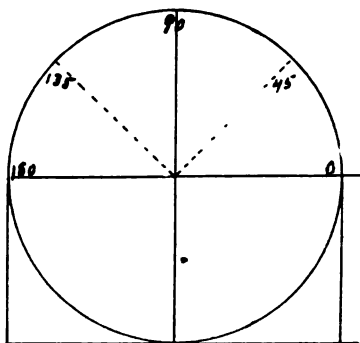


Fig. A

In considering mentalities we must keep within smaller limits, say from the 45th to the 135th meridian, which gives 90 degrees or 324,000 seconds. Let the 648,000 seconds from 0 to 180 represent as many people, of whom 324,000 are within the limit angles of sanity and we find but one of them is perpendicular, or absolutely balanced. How many readers know such a person? Let those below the lines 45 and 135 represent children, those confined in institutions (and indians, not taxed), and we have the physical proof that only one person in every 324,000 is not a little peculiar.

ANSWERS.

1. A Greek word meaning "after physics" according to Aristotle, who believed physics, or the science of natural bodies to be the first subject for study and that inquiry into the origin and functions of the mind is the next in order.

2. The science or art of reasoning correctly.
3. Arrogance. Bull-headed ignorance, usually.
4. The study of the mind.
5. Beginning.
6. Belief in Christian dogmas.
7. Disbelief in Christian dogmas.
8. Heterodoxy.
9. An integer of thought.
10. A product of reasoning, logically or illogically.
11. That infinite possession that dominates the will.
12. Positive information with proofs.
13. Knowledge.
14. Book learning.
15. Knowledge or book learning.
16. Spoken or written expression.
17. The art or science of theorizing; speculation or reasoning.
18. Pertains to the conduct of society.
19. The science of government.
20. Natural order and justice.
21. Legislative enactments, called laws.
22. A claim of personal intercourse with God as a person.
23. The devil evidently, because the bible says none are without sin and under Christian influences evil prevails.
24. The science of the structure of the body.
25. The science of the functions of the body.
26. The elements in the structure of the body.
27. Intellect and mechanics.
28. Cerebrum, cerebellum, pons varolii and medulla oblongata.
29. Cerebro-spinal and sympathetic.
30. Chemical reactions and molecular friction.
30. Chemical reactions and molecular friction.
31. Sensation and motion.
32. Special senses and heat, vaso-motor and musculo-motor.
33. Oxygenization and decarbonization.
34. The right because it has more room to develop.
35. Right and left auricles, right and left ventricles.
36. Eustachian and tricuspid on right side, mitral and semilunar on the left.

37. Arteries and veins.
38. The vessels that convey the blood from the heart to the lungs and return.
39. The arteries and veins that convey the blood through the body.
40. It is formed by the superior and inferior mesenteric, splenic and gastric veins which convey crude blood from the digestive apparatus to the liver; these unite behind the head of the pancreas to form the portal vein.
41. An absorbent system which carries certain elements to and from the blood.
42. A part of the lymphatic system connecting the small intestines with it.
43. Folds of the peritoneum.
44. Semi-independent nerve centers.
45. A network formed by the junction of two or more nerves or vessels.
46. A union of nerves similar to a plexus.
47. To assist in preparing crude blood. An organ of assimilation.
48. To supply juices for chemical reaction on food in the duodenum.
49. To do the coarse work of digestion.
50. To extract glucose and urea from the blood and supply bile for use with the pancreatic juices in the duodenum.
51. To extract urine from the blood.
52. To furnish antitoxin to the blood.
53. To assist in digestion and excrete waste.
54. Stomach, spleen, pancreas, liver, kidneys, bladder, procreative apparatus, many vessels and nerves and the peritoneum.
55. Lungs, heart, aorta, esophagus, pleura and pericardium.
56. By mechanical actions and chemical reactions.
57. Swallowing food.
58. Assimilation of food.
59. Absorption.
60. Dilation of any vessel or tube, the stomach, bladder or other organ from overloading.
61. The act of passing liquids or other substances through walls, by pressure, which are otherwise impenetrable.
62. The junction of vessels. Synonymous with plexus as used with reference to nerves.
63. The principal solid of urine.
64. An acid found in the urine of mankind, particularly those who eat much meat and starchy food, such as patent breakfast foods, so widely advertised.

65. One of the chief constituents of the body. The white of eggs is nearly all albumen.

66. Carbonic acid gas a form of waste discharged through the lungs.

67. The mouth, pharynx, esophagus, stomach, duodenum, jejunum, ileum, caecum, colon, rectum, anus.

68. The first have nerves, the second none.

69. White, nerveless cords supporting the muscles in various parts of the body.

70. Bands of white, fibrous tissue, non-nervous and elastic, utilized in some places as substitutes for muscles, notably the suspensory ligaments of the ciliary body, at the union of joints, etc.

71. Usually to the periosteum. In organs, to the hard coat, as the sclerotic of the eyes.

72. Really two, but in the right lobe are three lobules, so the anatomists say five.

73. It is one of the ductless glands; the others are the supra-renal capsules, the thyroid and thymus glands.

74. It comprises two lobes, one on either side of the trachea, each is about two inches long, an inch thick and three-fourths of an inch wide. Its function is obscure, but it appears to have much to do with nutrition.

75. In the lower part of the neck and upper end of the thoracic cavity, behind the sternum or breast bone. It is a temporary organ and usually atrophies and disappears about the age of puberty.

76. Seven.

77. Twelve.

78. Five.

79. Five.

80. Four.

81. The first cervical vertebra.

82. The second cervical vertebra.

83. Hypoglossus, styloglossus, genio-hypo-glossus, and palato-glossus.

84. Two hundred and thirty-eight, counting thirty-two teeth.

85. Contents of the head, thoracic and abdominal cavities.

86. The sack containing the lungs.

87. The sack containing the heart.

88. Tough connective tissue surrounding bones.

89. The lining of the abdomen, enclosing all the viscera, except the kidneys, which lie between it and the posterior wall.

90. The structure between the genital organs and the anus.

91. The lining of the heart.

92. The aorta, two coronary, innominate, left common carotid, left subclavian, and common iliacs.

93. It arises from the arch of the aorta, is about two inches long and divides into the right common carotid and right subclavian.

94. The pulmonary, systemic and portal. Of the systemic, the superior and inferior vena cava, the innominate, the subclavian, the jugular, the iliacs and cardiacs.

95. They are nine. In the middle are the epigastric, umbilical, hypogastric; on the right, the right hypochondriac, right lumbar, right inguinal; on the left, the left hypochondriac, left lumbar, left inguinal.

96. Hammer, anvil and stirrups.

97. By the portal being closed while the hepatic, being attached to the body of the organ, are open.

98. A measure or standard.

99. The science of the nerves and accessories.

100. A nerve test under pressure.

101. A nerve test with pressure removed.

102. Adjustment of the crystalline lens.

103. Fixing the two eyes on a near object at once.

104. Working accommodation and convergence at once in the proper relation for near points.

105. Working accommodation for distance when convergence is not needed but comes automatically, or converging, in myopia when accommodation is not needed but comes automatically.

106. A circular one around an opening or in such a position as the sphincter muscle of the ciliary body.

107. Sclerotic, choroid, pigment, retina, hyaloid.

108. Membrana limitans interna, optic nerve fibres, ganglionic, internal molecular, internal granular, external molecular, external limiting membrane, Jacob's membrane or layer of rods and cones.

109. At the sclero-corneal junction; sometimes called Fontana's space.

110. Rods and cones of retina.

111. The space around the optic nerve entrance where the ophthalmic artery branches pierce the sclerotic.

112. In anterior portion of ciliary body. Is of doubtful existence.

113. The vascular layers comprising the choroid, ciliary body and iris.

114. The several layers.

115. The field of most acute sensitiveness at the posterior pole. It is not a "yellow spot," as the name implies.

116. It is the optical axis.

117. A fibrous structure enclosing the eyeball forming a cushion between it and the walls of the orbit.

118. The portion of the tunica vaginalis posterior to where the muscles pass through it.

119. The portion of the above anterior to where the muscles pass through it.

126. Five: Layer of conjunctival epithelium, anterior elastic layer, true tissue, posterior elastic layer, posterior epithelial layer.

121. Aqueous humor, 1.33; crystalline, 1.40; vitreous, 1.33; as a whole, 1.50.

122. It is the ciliary sphincter.

123. The fourth layer of the cornea.

124. The suspensory ligaments of the iris.

125. Brittle or glass-like.

126. Transparent or glass-like.

127. Around the edge of the crystalline lens.

128. Two intrinsic, the sphincters of the iris and ciliary body; six extrinsic, the superior and inferior oblique, and four recti.

129. They are sensory ganglia at the base of the brain.

130. Two small eminences on the thalami.

131. They are the optic lobes of the brain, four projections under the corpus callosum, or great brain commissure; the two anterior are called nates and the posterior are called testes.

132. The place where the two optic nerves divide and cross.

133. The appendages of the eyes.

134. At the upper outer corner of the orbits.

135. The folds of choroid, suspensory ligaments, sphincter muscle and canal of Pettit.

136. The great commissure or switchboard of the brain situated in the middle of the head.

137. Reasonable thought according to Nature's laws.

138. The demonstrable branch of natural philosophy.

139. That which causes or arrests motion.

140. The product of natural or artificial forces.

141. Compactness, solidity.

142. The change in its course a ray suffers in passing obliquely from one transparent medium to another of different density.

143. The relative density of one transparent medium compared with another of greater or less density.

144. The repulsion of approaching rays.

145. If it were not for reflection we could see nothing except luminous objects.

146. The splintering of rays into their elementary parts; as exhibited by colors.

147. That which is lost in the body, of the lens.
148. A beam or a pencil.
149. A ray or a pencil.
150. A beam or a ray.
151. At the connecting surface between two mediums.
152. When a beam or ray or pencil approaches obliquely, but within the limit angle that part crossing the dividing line moves faster or slower, according to the relative density of the mediums and the ray is thus broken so that its course is changed.
153. A line from horizon to horizon tangent to a globe.
154. A line at right angles to horizontal.
155. A line at right angles to any other line.
156. A line neither vertical nor horizontal.
157. Two lines equally distant from each other constantly.
158. A ray as it approaches the surface connecting two mediums is called incident.
159. That portion of an incident ray which is repelled at the connecting surface between two mediums.
160. An incident oblique ray is broken at the connecting surface between two mediums and is called the refracted ray.
161. The refracted ray as it emerges from the medium in which it acquired the name refracted is renamed emergent. Thus questions 158, 159, 160, 161 give us four sections of the same ray.
162. The angles are formed by the four sections named and the perpendiculars to the surfaces at the points where refraction occurred.
163. The density of the mediums and the angles of incidence.
164. That rays are broken out of their course toward the perpendicular in entering the denser medium and from the perpendicular in entering the rarer medium.
165. The angle at which total reflection occurs—about 50° from the perpendicular, in glass.
166. That there is a limit angle to everything; laws, rules, ability, temper, etc.
167. A transparent wedge.
168. Rays are always broken toward the base line.
169. That objects seen through a prism are always apparently displaced toward the apex.
170. In multitudinous quantities of different angles so that curved surfaces are formed. For + spheres they are grouped bases toward a central point; for — spheres they are reversed. For + cylinders they are arranged on either side of a line, bases in; for — cylinders they are placed bases out.

171. Two: sphericals and cylindricals, and each of these are two + and —.

172. There are two, principal and secondary; the first is a line drawn through the center or centers of curvature, therefore is perpendicular to both surfaces and passes without a refraction, hence it is called the principal axis. The secondary axes include all lines, drawn from an object to its image, which cross the principal axis at the optical center of a lens.

173. Focus, according to the Greeks, means "fire-point." As we use it the point where rays meet on the axis after passing a lens is called its focus.

174. Four: Two principal and two conjugate.

175. The first are the points on either side from which rays starting divergent toward a lens will be rendered parallel by it, or, the points on either side where rays, which were parallel to its axis on approaching a lens are brought to a focus by it. They are fixed points and have no relation to each other. The second are the points respectively from which rays leave an object and approach a lens divergent to be converged to a point where the image is formed after passing. They are movable and are yoked together as the rays from the first or objective point form the second or subjective point, the image.

176. The points on the principal axis essential to schematic demonstration of structure and function, and the lines drawn at right angles to the axis through those points.

177. A line from center to periphery of a circle.

178. A line drawn from one side of a circle to the other through the center.

179. Truly, a center of curvature. For optical purposes, the points on the principal axis where secondary axis rays would cross if they suffered no refraction.

180. Of the first a plano lens has but one. Of the second all lenses have two.

181. A symmetrically curved yet not a spherical lens. A segment of a tore.

182. The color effect from dispersion of light.

183. The lack of perfect focus on account of the progressive increase of curvature toward the edge of a + sphere which causes the edge rays to focus sooner than those nearer the axis.

184. One that comprises crown and flint glass in such arrangement as prevents chromatic aberration.

185. An arrangement of crown and flint glass so that both chromatic and spherical aberration are prevented.

186. One of non-spherical curvatures, consequently without a focus.
187. One in which there is a combination of sphere and cylinder.
188. One comprising a segment of a cylinder only.
189. A prism held a few inches from the face while objects are observed through it displaces them toward its apex, but moving the prism back and forth across the line of vision causes no movement, while rotating it does. A sphere may be rotated without causing motion but shaking it does move objects; + moves against, except when object or operator is beyond conjugate focus, when it reverses; — moves objects with the operator's motion. Cylinders distort objects when rotated, move them only when moved back and forth across the axis or toward and from the operator. Combinations betray the presence of the different elements by their conduct.
190. The speed of rays in different mediums is inversely as the density; that is, if glass is 50% denser than air, a ray will move 50% faster in the air than in the glass, consequently the angle of incidence is always as much larger than the angle of refraction as the index of the denser medium is greater than the index of the rarer.
191. The latter would have to be each twice the former.
192. Multiply the focus by the index less 1.00. Thus, glass is 1.53; use only the .53.
193. Divide the radius by the focus and prefix 1.
194. Divide the radius by the index less 1.
195. A small lens ground, or cemented, in the center of a plano glass of desired size. They are rarely used except for myopes of high degree or after cataract operations. The object is to reduce weight.
196. By refraction.
197. By reflection.
198. There is no such a thing. The so-called virtual images of alleged authorities are really virtual objects. The operator observes an object through a lens and sees an apparently reduced or enlarged object, as he uses a — or + lens.
199. Because the combination has a common optical center.
200. One in which there are two single systems, or combinations, having two separate optical centers. Images formed by them are erect, that is, right side up.
201. Because it is the medium through which light comes to us.
202. Considering glass 1.50 the index of air would be .66 $\frac{2}{3}$ because 1.00 is two-thirds of 1.50; but glass is to be regarded as 1.53 the index of air would be exactly .65424183 + because 1.53 will go into 1.00, that fractional part of one time.
203. Two, theoretical and practical.

204. That all things are learned by such methods.
205. Twice the principal focal distance.
206. To see through.
207. A unit of measure.
208. One which will receive parallel rays and focus them one meter beyond.
209. A French unit of measure; in our inches it equals 39.368+.
210. At 16 inches, because the rays from 26 inches required +1.50 power to render them parallel and remaining + 2.50 of the + 4.00 would focus them again at 16 inches beyond.
211. At 40 inches on the other side, because 10 inches required + 4.00 on the image's side leaving + 1.00 to do the work on the rays from the object and as + 1.00 equals 40 inches the position of the object is located.
212. The first conjugate focus being 32 inches equals + 1.25 while the second, 12 inches equals + 3.25 the lens must equal both or + 4.50.
213. One shaped like a new moon.
214. Salts.
215. The first is theoretical and the second a practical proposition.
216. As we use it, a line drawn from center to periphery of a circle or from side to side through the center, the same as a radius or diameter.
217. Straight lines and curves.
218. By neutralization.
219. Practically none. Either can be duplicated with the other.
220. They would be still divergent after passing the lens, although not so much.
221. The effect is the same as if it were a — lens.
222. That all +, or positive influences become —, or negative. if overdone.
223. In straight lines.
224. Those things which are fixed.
225. Those things which are changeable.
226. Principles that work mathematically, as cause and effect.
227. Guides to action or conduct based upon laws.
228. The point where secondary axial rays cross the principal axis.
229. One in which the optical axis is not in the center of the circumference.
230. Because the angle of reflection always equals the angle of incidence.
231. By measuring the foci of the two principal meridians.
232. The deflection light suffers in passing through a small aperture.
233. Same as refraction.
234. + 1.00 + 1.00 ax 90.

- 235. $+ 1.50$ ax 50 .
- 236. $-.50 + 2.00$ ax 135 .
- 237. $+ 1.50$ sphere.
- 238. $+ 1.50 - 450$ ax 135 .
- 239. $+ 3.00 - 1.50$ ax 180 .
- 240. $- 7.00 + 5.00$ ax 90 .
- 241. 90 and 180 .
- 242. $+ .50 - 2.00$ ax 180 .
- 243. $- 2.00 + 5.00$ ax 60 .
- 244. $+ 2.00 - 5.00$ ax 60 .
- 245. L, $+ 1.25 + .50$ ax 180 ; R, $+ 1.00 + .50$ ax 90 .
- 246. L, $+ 2.25 + 1.00$ ax 180 ; R, $+ 1.00 + 5.00$ ax 90 .
- 247. $+ 8.00 + 4.00 + 3.00$ ax 90 .
- 248. $- 6.00$ ax 180 $\cup$ $+ 5.00$ ax 90 .
- 249. $+ 4.00 + 2.00$ ax 45 .
- 250. Because of the natural law that all regular non-spherical curvatures have their two principal meridians at right angles.
- 251. Sunlight, lightning, phosphorescence, fire-flies, glow-worms, etc.
- 252. A nervous convulsion exhibited locally.
- 253. As mental or hysteria and physiological or involuntary functional activity.
- 254. That called clonic physiological.
- 255. Tonic spasm and neurasthenia.
- 256. The first is dangerous locally, that is it might cause hemorrhages in stout people or a stroke of paralysis affecting a part. The other is dangerous to life.
- 257. Whenever in doubt. They cannot do harm and always do some good.
- 258. When the sphere is extra strong and the cylinder less than 1.00 ; for example, $+ 10.00 + 1.00$ ax. 90 , give either $+ 10.50$ bi-convex thus making the flattest surfaces and saving the chromatic and spherical aberration; also for myopes of high degree.
- 259. In mixed astigmatism or compound myopia, where the spheres are $-.50$ or less and vision without them is as good as $20/30$.
- 260. When $-$ cylinders give $20/20$, combine enough sphere to reduce vision to $20/30$.
- 261. Sometimes a patient appears to be a myope requiring $- 1.00$ ax. 180 or less cylinder to give $20/20$ vision but will see as well with a $+$ cylinder, axis reversed, as he did with naked eyes, and of course the $+$ would be prescribed. Or a myope requiring $- 2.00$ ax. 180 for distance, or even more, and being presbyopic would need a $+$ cylinder of same strength, axis

reversed, for near work. Or a simple myope of less than 2.00 D. might require + 1.00 for reading.

262. Forward and back about seventy-eight times a minute in adults, slightly faster in children, and slower in old folks.

263. Inspire and expire about eighteen times a minute.

464. Nothing particularly unless the misses are frequent and regular. If constant and weak it signifies nerve weakness in the cerebellum. If periodic and strong it means nerve irritation:

265. Yes. Children and old people must be treated more delicately, because the first have not yet matured and the others are on the decline.

266. They are usually mental hobbies associated with real physiological conditional disturbances, and are a little more difficult to deal with because the patient is less liable to follow instructions and more liable to deceive us.

267. It consists of securing the voluntary and involuntary confidence of the patient, mentally and physiologically by mental and mechanical methods, which tell us truly when it is accomplished and when it is not we know how to proceed. Of course if there are no indications of winning the only thing to do is to dismiss the case without further effort.

268. Only when a patient did not ask it and I, knowing it was a positively easy case, wanted to fog the patient fully; that is impress my own confidence.

269. Because the request would imply a doubt, inasmuch as the old school doctors dare not guarantee anything, and I would not yield that much because it would rather tend to increase his distrust. I would ask him if any other doctor ever guaranteed anything, and if not, why I should.

270. Always in advance, because if a patient has paid his money he will be more apt to follow instructions.

271. By the plain statement that I am running my own business and have to do it my way or not at all. Then I would explain that I could not afford to do other than my best and that anyone not willing to trust me should not become my patient.

272. Refuse to have anything to do with the case, because I would thus avoid responsibility for a disastrous termination of the trouble, and by refusing I might force him to come to my terms and thus insure good results.

273. I would refuse because he has no right to ask me to involve my reputation or judgment and he has no right to assume his opinions in such matters are as good as mine.

I would rather my child should grow up and have different ideas from mine if he could prove their correctness, than to have him adopt mine as correct because I say they are.

MEMORANDUM

MISCELLANEOUS PORTION

MISCELLANEOUS PORTION

THE MATTER OF FEES

**The Doctor Who Can Secure Good Results Should Charge Correspondingly
for His Work.**

Skill is not always displayed in doing things. Sometimes it is much more creditable to wait, and it is always true that one should not do a thing till he knows why he does it. An old preceptor once told me, "Any damned fool can give medicine; it takes a good doctor to know when to withhold it." The practice of a profession is not manual labor, it is not to be measured in value by the amount of time it takes to secure the results or to make an examination, but it is to be valued by the skill of the practitioner. If one values his ability at so much per visit in the practice of medicine, making no distinction between the different cases, he is practically admitting that they are all the same to him, as indeed they are, because he keeps up his visits, at so much per, until the patient recovers, or dies, and he answers my argument by saying that is the way he gets more for a typhoid fever case than for an attack of measles.

I say that is the reason nearly all doctors are poor—they are not business men. The ones who made the code of ethics are, however; they have succeeded in putting "honor" to the profession above honor to self and the public, and they are reaping the harvest.

All other practitioners "diagnose" cases and "treat" them, claiming "cures," etc. Neurologists do nothing of the kind. They analyze conditions, figure their cases out and teach patients how to "treat" themselves, so that Nature, the only "healer," can have the best possible chance to "cure." They practice no mysteries, and restrict their work to those who are mentally able to comprehend and follow instructions, and physically

competent to come to their offices. We laugh at the polysyllabic names given to alleged diseases, such as amenorrhoea, dysmenorrhoea, menorrhagia, apoplexy, epilepsy, chorea, albuminuria, chlorosis, dyspepsia, tuberculosis, neuralgia, rheumatism, endometritis, prostaticorrhoea, trachoma, because we know that all ills come from either shock or strain inflicted upon the nervous system; that the effects exhibited are different as the locations of the causes; that a symptom can mean nothing definite until its cause has been ascertained; and here is our strong point: we know how to ascertain. We have a method of measuring the nervous system so perfectly that we are not only able to locate causes of troubles, but we can measure the damage done, and find the extent of the supply left for recuperative purposes, so that we can tell our patients exactly what their chances are and how much liberty they can take with Nature without danger to their lives and health. We do not pretend to either treat or cure—only liars do that—but we impress on patients their responsibility. Our services are almost like a lawyer's; inasmuch as we first know our profession, then advise, and assist. Our services are valuable, and really cheap, because we get good results in the very cases where others' methods failed and the practitioners pronounced them chronic.

To examine eyes as we do it is worth ten dollars of anyone's money. To make a general examination is worth twenty-five dollars. And, as nearly all cases of eye trouble have run so long a general examination is needed, I have ceased to make any examination for less than twenty-five dollars. Often that is all the expense to the patient, however, so it is cheap after all.

If a neurologist takes a case that has been pow-wowed over for fifteen or sixteen years by practitioners of old methods, he must charge a good big fee for two reasons: First, it is worth a good deal to such people to get well; second, if the fee is not unusually high many old chronics will have less confidence in the method, for they come to have a pride in being "the worst ever." And, no matter if one knows he and Nature can make a perfectly well individual in a few weeks, to say so would appear presumptuous to those who have long looked on their troubles as unconquerable; hence it is most diplomatic and conducive to success to take cases at the other fellow's estimates, and, at most, promise only partial relief soon, and a complete cure in a few months. This has two good effects, one on the patient's mentality in the matter of importance of the case, and the other on his physical system in giving it more time, under your care and instructions, to recuperate to a normal standard. Get your entire fee in advance for two reasons: First, you are sure of it; second, the patient knows the cost and if he wants the worth of his money he will follow instructions better, and thus insure best results.

NEUROLOGY'S PROCLAMATION.

We Offer Skill and Integrity to a Suffering Public, and Will Insist on the "Square Deal."

A doctor of neurology, (N. D.), is one qualified through the study of Nature's laws, as applied physiologically, to instruct others in the science of health so that they may secure health and retain it, provided they follow the advice. In other words, the true neurologist is a health lawyer, and people who want the best of everything and are willing to pay for it are the only clients he cares for. This is not so much because he wants the money as because people with such rational ideas will understand readily that cures depend entirely upon themselves and Nature. They have intelligence enough to understand the true value of health and the true value of the advice, which, when followed, insures it.

So-called diseases, such as are named dyspepsia, headache, indigestion, constipation, piles, and all kinds of female troubles, dullness in children, bed-wetting, St. Vitus' dance, epilepsy, cold hands and feet, and many others, are simply derangements of the nervous system which do not need medicine, and despite the fact countless tons of it have been taken and hundreds of thousands of dollars paid for it, good results come not. A mechanical cause is one thing and a chemical cause is another. All causes must affect the nervous system before they can do possible damage.

The nervous system heats the body; it affords the sensations of sight, hearing, taste, etc.; it affords the motive power for the organs and tubular systems as well as locomotion, and it is the medium through which the warnings, pain and fever, are transmitted and by which we are enabled to trace the causes to their sources. If we find them to be mechanical we reach them by rest, by dietary, by correction of habits and adjustment of defects and displacements. If we find them to be chemical, instead of giving medicine, we make the necessary changes in diet, both quantitatively and qualitatively. We have no secrets from our patients. We do nothing in a mysterious way. (That is the sole prerogative of the Almighty.) We have no fear of our patients assuming to practice without first qualifying as we did, hence we do not write our prescriptions in Latin. It is true we accomplish things that are wonderful to the average mind. They are just as wonderful to the old-school doctor as to the layman, because our methods are entirely foreign to those of old schools, but we will be glad to explain them and show their simplicity to either.

One of the notable things accomplished by our methods is that fat people are reduced and lean people increased on the same diet. This is because in the first instance we take away, for a time, the food elements that are necessary to maintain so much flesh, hence it follows the natural law of cause and effect and comes down. In the second instance the quality being such as to build up the nerve and muscle departments enables the

patient to assimilate his food better by increasing the dynamics of his system, both chemically and mechanically. It has been proved so abundantly in the twelve years that neurology has been established, that it admits of no argument.

Another thing which might be regarded as wonderful is that we are able to diagnose many conditions and their causes by looking into the eyes with an ophthalmoscope. Hence we call them our blood gauges; we are also able to use the eyes to measure the condition of the nerve supply so accurately that we can tell our patient's age when we have finished. (To those who are sensitive about the subject we will say all such matters are professional secrets with us.) Incidentally, of course, we measure and correct eye defects because in using them for nerve gauges we must first make them perfect. We are not oculists nor opticians nor eye specialists; we are neurologists, which means much more, because many alleged eye diseases, often treated by the month and year, get well in a week or less when our advice is followed.

Another wonderful thing, which, to us, is just as simple as the above, is the manner in which our patients recover from floating kidney or female troubles, without surgery or other humiliation.

In a nutshell, neurology is a science of diagnosis and analysis which makes every practitioner who understands it an authority, because he finds causes, when the remedy suggests itself, and here we will give away the great secret of our success: The old schools, having been taught that certain symptoms indicate certain causes and certain drugs, proceed upon that philosophy. Our pioneers found that was wrong. They found that one case may produce many different effects, and those effects become the causes of other effects, and these effects become the causes of still other effects, and so on, ad infinitum. Hence the old school methods of treating the last apparent cause was a mistake because it was really treating effects. It is possible that in some cases their medicines aided nature, but in a vast majority it is absolutely certain that nature did the curing in spite of the drugs. Now for the secret. We know the other fellow began at the bottom and worked up. He failed. We begin at the top and work down. We win every time when the patient follows instructions. The organs of the body are the brain, eyes, nose, mouth, ears, lungs, heart, diaphragm, stomach, liver, pancreas, spleen, intestines, kidneys, bladder and procreative organs.

When a patient comes to us we first ascertain his mental capacity, by observing him or her while we hear the complaints, briefly, by which we diagnose, that means guess at the mental and physical conditions. But we do not prescribe by that, as old-school doctors do. Next we ascertain the financial ability, requiring a fee in advance, from those who are able. (Those who are destitute shall not suffer through any mercenary motives

on our part.) Next the patient either leaves or we proceed to analyze the case from top to bottom. We test every machine in the body, and, knowing what it ought to be, if it is not up to standard we direct the engineer to run slow. If it is in a very bad way, or if several departments are involved, we shut down the engine entirely, except that there is always an involuntary current provided by nature to place it beyond the power of man to kill himself or others, without drugs or violence.

No person need have any fears of neurology except the mercenary drug doctor, and it is even his privilege to go and learn it.

Remember, the neurologist is not a cheap doctor in the sense that he works for so much a day or a visit, or for small amounts of money, but in the sense that his patients get most for their money, he is the cheapest. He does not solicit patronage. He feels that he is conferring a favor when he takes a case at his own price, particularly after all other methods have failed, and he takes no case except on guarantee that the patient will follow his directions, and that guarantee must be supported by the full amount of the fee. He is able to, and would guarantee in return, that Nature will cure, but for the fact that other doctors consider it unethical to do such things, and he wants to be as respectable as they are.

Neurology teaches that Nature gave us natural appetites and while they are easily perverted, we believe that as meats, vegetables, nuts, fruit, fish and fowl, etc., are palatable and harmless when taken in reasonable quantities, we have sufficient proof that all were intended for food. Hence we have little sympathy with either the cannibal or the vegetarian; both are intemperate. We have had demonstrated that the greater the pleasure, the greater the reaction. There is no human pleasure so great as that produced by the sexual act, but when one lets it run away with him to the extent that he cohabits with lewd women whose physical condition is unknown to him, or even he who indulges excessively with his wife, suffers the most excruciating penalties, either from syphilis and locomotor ataxia from the first cause or hypertrophy of the prostatic gland involving the bladder, etc., and finally impotence from the second cause.

While neurology, therefore, teaches temperance unequivocally, for common sense reasons and not through superstitious fear or hope of hell or heaven, the old schools teach, by inference at least, and thousands of their graduates practice the rankest intemperance in the use of opium and other drugs and liquors, as well as contemptible intolerance toward their fellow men, particularly those whom they regard as competitors. We leave the public to judge between us.

An infidel is one who professes to believe, but whose actions belie his words.

If you want to be right, always find out which way the crowd is going and go the other way.

SIGNIFICANCE OF PHYSIOGNOMY.

Objective Diagnostic Characteristics Which are Subject to Revision by Other Observers.

Every practitioner should cultivate the faculty of discernment with particular reference to the physiognomy. Of course it is important that the general proportions of head, body, legs, arms, etc., are correct, but from forehead to chin and from ear to ear tell a story peculiarly interesting and accurate. I shall only give my experience and observation, and note that there are occasional exceptions to all rules, leaving each student to continue the study in a practical manner.

A retreating forehead is on a weak mentality, supported by a weak constitution.

A retreating chin is not so bad as the above but is, to say the least erratic.

A round face, flat in front, is usually on an opinionated person. Better look out, the wearer may be well informed; it is well to try a little bluff, however, that is, stir it up, you may learn something worth while; if you do not, you will have a friend; such people always know when they are known.

A narrow, hatchet-face is jealous, puts on a great deal of pretense, is stubborn, generally wrong in controversies, and hunts trouble continually, often finds it, and is most content when making others miserable.

A low forehead is not so bad as it has been pictured. The owner is usually a money maker, and is not overly conscientious, but there are lots of worse people.

Square jaws indicate a conceit that is intolerable. Some wearers have learned that firmness is indicated. Not for a minute, unless it is to stick to a self-flattering opinion. They frequently pose for pictures, usually take pretty good ones, but always expose their nerve. They are absolutely inconsiderate of others and even make special efforts to cause inconvenience. There is not naturally an honest bone in their whole anatomy; they may not be dishonest, but it is merely because the opportunity never offered.

High cheek bones must be well supported by other prominences, or they mean a weak constitution. If surmounted by a big nose, heavy jaws and have a large head back of them, you could not kill one with a club.

A low, flat nose, like a nigger's, is always on a smart-aleck; usually pretty smart, too, but very disagreeable, because they will overstep the bounds of politeness, while you are ashamed to. Don't hesitate to sit on them, or they will squat on you.

A low nose bridge or deep set eyes, or both, usually mean hyperopic eyes, hence liver and stomach troubles.

Puffs or black crescents under the eyes mean interference with circulation of blood from deficient nerve supply.

A large nose nearly always indicates good nature and good judgment, just as a large person is usually good-natured. Just what the nose has to do with good nature I do not know, any more than I know why the rest is approximately true, but the coincidences remain.

A mouth that droops at the ends is quarrelsome.

A short upper lip is insanely jealous, loves only self, is susceptible to flattery and will imagine they love anyone who gives plenty of it. They are usually "society" people, at least in their imagination, and are satisfied if they can make a great show. Their ambition is to be rich and haughty. They rarely get the former, except by accident, because they put in too much time being haughty. They remind one of head-servants.

A square face, front view, is usually quiet, strongly opinionated, pretty reliable, somewhat unfathomable, but if not spoiled in the raising, are easy to get along with.

A mouth that turns up at the ends is attached to a sweet disposition, but, if not well supported by nose, chin, eyes and forehead, indicates a silly person, a lack of stamina. If backed properly, by chin, etc., they are the salt of the earth.

Thin lips are attached to a shrew or a tyrant. Extraordinarily thick lips indicate a natural coarseness, which may be trained down until they are very excellent people; they are usually firm friends.

If the lower lip rolls outward and hangs down it means a natural gossip, and all gossips are dangerous to the peace of the community in which they live.

People with straight mouths, like a slot cut in the face, and with thin lips, are gossips of the slanderous kind.

Eyes too close together mean lack of stamina, impetuosity, poor judgment, but often much ability; such people are easily influenced, and if they fall into the right company and remain there, will do well.

Eyes too far apart mean ignorance and bigotry every time. Such persons were born wise—in their own conceit—they never needed to learn, because their teachers are not yet born. Avoid them and escape trouble.

Eyes that twinkle affectedly as they look at you do so because they know if they did not vascillate you would discover their duplicity. They haven't sense enough to know you discover it anyhow.

Black eyes, the kind that are like coal and never fade, are in dangerous heads. They are the windows of jealous brains and guide a hand that carries a dagger. They are, of course, highly emotional, love and hate alternately the same object.

Black eyes that fade with advancing years are found in amiable people. They are usually inclined to brag and would rather misrepresent than tell the truth, particularly if by doing so they can make even a momentary

impression—it lasts, with them, all the time. They have good qualities, but are rarely honest, and are insufferably lax in keeping engagements.

Brown eyes that look straight at you are amiable, their owners quiet, and faithful to their friends. They have no great amount of push and are content with what the fates bestow, not given to puffing themselves and are real home people, if of average size or larger.

Gray eyes are found in a steady-going people, reliable as planetary evolutions, rarely set the world on fire, because there is not enough friction in their make-up. They look straight at you and see clear through you, too. Don't lie to them if you want their friendship. If they do not look straight at you, beware.

Blue eyes are in honest heads, unless they are too pale blue, when they are tricky. Of course association has much to do with character, and as there are more blue eyed people than of any other class, they will require more careful consideration with other features, because in reaching final conclusions all must be considered; several good points mitigate the bad ones, at least partly.

Narrow teeth indicate a weak constitution. Short, wide teeth mean endurance and tenacity, even to stubbornness.

A long upper lip means obstinacy in matters the owner understands, a lack of it in other matters; usually honest, but when dishonest they go to the limit. I have never seen such a person who was jealous.

Arched eyebrows indicate vanity; straight ones, rascality; medium, signify nothing in particular.

Ears too close to the head mean selfishness. If they stand straight out they indicate a weak character.

Don't trust people who laugh at every opportunity; they are unreliable. The woman giggler is a fool.

Vertical wrinkles between the eyebrows signify eye strain.

"Crows-feet" at the outer angles of the eyes indicate defective eyes.

Some people begin at the top of the ladder and go down.

When one boasts of his expertness it is positive evidence he is incompetent.

It requires educated brains to get the good out of machines, no matter for what purpose the implements are made.

No competent practitioner in any profession or trade, needs laws to protect him, or build up his business. All he needs is acquaintance.

Before one is competent to criticize he must be qualified to examine subjects intelligently and be armed with a simple method of making analyses. There are certain well-proved natural laws which apply equally to all things. According to these laws some propositions are impossible and can be settled quickly. Among such are the pretenses of those who declare that all whose opinions differ from theirs are crazy, or are charlatans.

SEXUALITY VS. SENSUALITY.

Reason in Battle Array Against Christian Superstition and Persecution.

In this priest-ridden country, in the year of "our Lord" 1905, August 9th, \$70,000 were the gate receipts at a prize-fight. Athletics, of the brutal foot-ball order, dominate the educational institutions. Christians insult their Creator by declaring the procreative organs are indecent, the study of them vulgar and the publication of instructions, with reference to their intelligent use, obscene. Crime is rampant, libertines stand in public places and insult women with impunity; trades-union leaders make their headquarters at sporting-house; society airs its debauches in the divorce courts, putting twelve-year-old girl keyhole peepers on the stand to witness; the U. S. army is involved. The president of the country deplores "race-suicide" and keeps in office sensual scoundrels who persecute intelligent men and women for writing common sense advice, which, if followed, would soon convince the world that it is better to have fewer children and more perfect ones; less voters but healthy ones. The men who are commissioned to censor rational productions of their intellectual superiors are, invariably, men who could not earn a hundred dollars a month were they not political touts and natural born pimps. The "holy bible" contains more obscenity to the square inch than any other book I ever read. It teaches only the sensual side of the copulative act and advises against it as a sin, but advertises forgiveness if offenders apply at the right place and pay tithes.

Let us take a look at this subject from a purely rational standpoint and answer without prejudice:

Why should we regard the sexual marks as any more lewd than any other part? I do not know.

Would we do so if we had not been taught to so look upon them? I believe not.

Is not the bible story that Adam and Eve covered their organs with fig-leaf aprons the first intimation that they were something to be ashamed of? Yes.

Has history ever disclosed a more unvirtuous people than Christians? No.

If the subject could be presented to us as physicians, or as thinking laymen, without our having any previous information, would we see anything lewd in it? I can not see why we should.

Would we not first endeavor to learn Nature's reason for making males and females different, and thus learn two physiological facts, first that connection yields the acme of human pleasures; second that reproduction of our species occurs? It appears so.

Would we not learn next that overindulgence produces bad after-effects in the male by weakening his vitality; in the female, destroying her comli-

ness by frequent pregnancies, and to both by burdening them with greater responsibilities than they can maintain properly? I think so.

Would not the fact that the pleasures to both from the act itself encourage research that they might have the pleasures without the aftermath and thus they come to a better understanding of what Nature intended? That is a natural conclusion.

One thing is certain: No statute can ever change Nature's laws, nor one of them. God gave the sexual organs and sensations to mankind, different from animals in almost every particular, for the dual purpose of promoting happiness between the sexes and for procreation. How do I know? Because of the existence of the two facts.

"But," one says, "it brings lots of unhappiness." Yes, when indulged beyond the limit-angle, and under present social conditions, because of the Christian training which makes even one who looks upon an attractive woman with desire "already an adulterer in his heart," hence subject to punishment, according to their code, unless he repents and pays.

If one eats to excess, or of the wrong kind of food, persistently it causes unhappiness too. Is that lewd in the estimation of these "holier than thou" "scribes and pharisees, hypocrites" against whom Christ pronounced "Woe unto you!"

The Christian example has taught the young men that if they can accomplish the sexual act by persuasion, even under promise of marriage, that the girl thereby forfeits all social rights, but if the man is condemned at all it is only for a few days, then he is congratulated on his "escape from a bad woman." Where do they get their authority for this discrimination? Christian gossips even slander lively girls whom their lewd minds suspect of being constituted so they might give themselves up to a man they loved. If such people were prosecuted until they learned to attend to their own business there would be more justice done and more jails full than in the present condition.

To the honest student of Nature's laws all were devised beneficently, and all the vile curs like the Comstocks and the McAfees can not prevent investigation and thought and the dissemination of truths about all subjects. I have never seen any of the writings of intelligent men and women, upon the sexual relation, that come anywhere near lewdness as it appears in the bible. I have never seen anything that could possibly have worked harm one-tenth as great as is produced by the ignorant licentiousness that prevails to-day. Here is a case in point from New York dispatches in August:

Helen Elster, not 12 years old, daughter of Mrs. Henry Pabenz, died in the Post Graduate Hospital to-day as a result of an operation, following which the child gave birth to a fully developed babe. Little is known of the history of the case, but a rigid investigation is being made. The child's mother thought she had some dropsical affection, and as her own physician

could make nothing of the case she sent her to the hospital. The physicians treated the child for girl trouble and performed the operation in connection with that. The physicians reported the cause of death as eclampsia, a disease of the kidneys, and declared they knew nothing about the child's real condition until they operated. The baby is alive, and the physicians say it will live.

Incidentally the report illustrates the absolute incompetence of the doctors at the hospital. No man, educated as I would have them all, would have been dishonorable enough to have put the child in such a condition; and no girl of her age, trained as I would have their mothers train them, would ever permit it, unless she did it deliberately, and then she would have no hesitancy in telling it to mother or doctor, thus saving her life, possibly.

As to the sexual organs and act of copulation, physicians know little and laymen nothing. In my classes I have often doctors of ten to thirty years' practical experience who could not tell the story of procreation in detail, from the testicles of the male to the ovaries of the female, if their lives depended on it, but they can describe the "pathological anatomy" of a hundred diseases that never existed outside of books. They know how to deliver a child with forceps and are fully convinced that no child was ever born right until the obstetrician and the trained nurse, in uniform, were discovered. Yet all of them over fifty years of age first breathed air with no other and than good stiff uterine contractions in their mother and old maid aunts washed and dressed them.

The young licentiate boasts of his ability to sign birth and death certificates according to law, yet his professors are unable to recognize the difference between dropsy and a seven-months' baby. And they call old-school medicine a science.

I want the doctors who receive this book to remember that "doctor" means "teacher," that it is their duty to investigate, learn and teach their patients how to keep well and enjoy the blessings Nature has bestowed. Men and Women should be taught the truth instead of fancies and foibles of superstitious minds.

The woman has as much right to pleasure from the sexual act as the man. He should know that caresses, from pleasant words and kisses to copulation constitute the sexual function. He should know that the longer he delays the final act the greater the pleasure for both. He should know that the orgasms which he enjoys are harmful to him if repeated too often, because each time he empties his vesiculæ seminales Nature sets machinery at work to refill them and that takes nervous energy. He should know that total abstinence from orgasms is almost as bad, because in time there will be atrophy of the parts. He should know that when he is too eager, hence finishes before the female reaches a climax it is bad for her because it is both physically and mentally disappointing and produces frigidity in her

when nothing else would. He should know that Nature intended him to enjoy the act without going to the point of ejaculation each time, and by so doing he is not only privileged to enjoy it more frequently but he endears himself to his companion by giving her the full meed of pleasure. He should know that she does not waste vitality by her orgasms but rather invigorates her apparatus. But she should be permitted to lie quiet for some time after, which she can do if he has not laid her liable to impregnation. More woe has been caused to women by arising instantly and using a syringe with either hot or cold water, to avoid impregnation, than was ever caused by emmenagogue pills or abortion doctors. He should know that to give pleasure and contain himself the bodies should remain close together. To get the instruction direct from Nature, let the usual position be reversed, when the woman will instinctively cling closer, while the man, remaining passive, has a mental exaltation in the consciousness that he is master of himself and is giving her, whom he loves, the maximum benefit. This has been called male continence to differentiate it from the incontinence which is a sure sequel to excessive indulgence to the point of ejaculation.

I have frequently met the assertion, among my brethren, that continence is injurious. I invariably reply with the query, "Why?" Then they begin to dodge; but I pin them down and find them utterly ignorant of every feature of the matter. I have been practicing and teaching continence for twenty years and have yet to see bad results, while I have been blessed by many a wife whose husband attended my lectures and practiced their teachings.

I have also met an argument like this: "But suppose the young men and women learned these tactics and practiced them?" To such I reply that the last two words of the question is the answer that would prevent harm. If they did not practice them conditions would remain as they are now—bad.

Christian society is rotten. Conditions could not be worse. It insults intelligence infinite and mundane by denouncing as "free-lovers" all who would educate their fellows to honor and virtue, and crowds the courts to secure food for gossip and "proof" that the sexual topic is nasty, obscene, etc., when such cases are from their own putrid ranks ninety-nine times out of a hundred.

As proof that "ignorance is bliss" this same Christian society to-day worships, at a shrine of their own creating, a lovely woman whose character is above suspicion or criticism, whose intellect soars above theirs like an eagle above a field mouse, yet she was born out of wed-lock, but is a product of two souls as truly married as Nature ever performed the service. I have no fault to find with her. I congratulate her parents on the flattering, practical evidence of Nature's approval. If this be obscene make the most of it.

A PATHETIC SITUATION.

Young Doctors From Old Schools Are Kept Down by Their Elders to Almost Starvation.

Quite frequently I receive letters from old school graduates who have been struggling against the adverse conditions created by a fool code of ethics and their older competitors, in which they say, "Of course, I am not yet self-sustaining," etc., or their friends write or call with the same story, asking favors in their behalf. If I were able, financially, to give my time free and pay my own expenses while teaching them a practical profession which affords results to patients and remuneration to the doctors, I would be glad to take them in; if for nothing else, to show the code the contempt I have for it and to show the old schools how little they are worth as breadwinners.

But the question comes to me: Why the oft repeated expression "of course," and I am going to answer it. The public has been taught by the older doctors that a young doctor is no good until he has had experience. Now that is either true or false; if true, the colleges bunko their students out of four years' time and a large amount of money. If it is false, the colleges owe it to themselves to prove it. I know it is true of the old schools, and the reason is they teach in such a desultory manner that ninety per cent of their graduates have only a vocabulary and a swelled head for their labors. The other ten per cent have a pull and get a start by working a year or two for some old practitioner, or accidentally getting a case which appears desperate and recovers while in their care. The young doctors have made serious mistakes in diagnosis and in prescribing deadly drugs from memory and giving overdoses; being unseasoned, often only on the verge of manhood when graduated, they are not able to maintain their equanimity and the public catches on, to their discredit. Somewhere in the neighborhood of fifty students of the Northwestern and Hahnemann pass my office every day and fully half of the number are too young to get in my school. Some are dwarfs, some are cripples, and many swagger to and from Greek-letter fraternity houses, usually a cheap boarding arrangement, and they flatter themselves they are impressing their neighbors with their mightiness—a form of self-deception which ruins them as mixers and loses many dollars for them when they locate. Section 2, Article V, of the "Principles of Medical Ethics," commands them to "maintain a peculiar reserve toward the public," and they do it with a zest that would be funny were it not so pathetic in its idiocy. They assume the public to be a lot of fools, and that becomes so offensive it provokes retaliation which takes the awful form of ignoring their existence absolutely.

"Of course" it is complimentary to my school that they apply to it for a sure means of success after the old schools have failed to qualify

them to make a living, but I cannot see why I should be asked to do it for nothing or on credit. However, that seems to be the way of all the victims of old school practices, for my boys and girls report hundreds of cases annually who apply for treatment after the other fellows have failed, and they almost invariably declare they have paid doctors about all they are going to, evidently expecting to thus squelch all ideas of a respectable fee. It is worth more to take a case after the others have aggravated it, and they soon learn that fact, too.

Now comes the worst feature of it all. After their failures with drugs and operations, when their patients leave them and go to a neurologist, who has been taught anatomy and physiology, pathology, dietetics, ophthalmology, neurology, analysis and rational therapeutics, but not materia-medica, bacteriology and histology, they fly to the alleged laws and want the neurologist prosecuted as a criminal, because they say he has no right to compete with them and cure their patients until he has disqualified himself as they did by patronizing some orthodox school for four years. By what system of reasoning they reach the conclusion that sickness was intended for the benefit of the doctors I cannot even imagine. Were it not for the rascality of politicians, from the highest in authority to the lowest, their insolence would not be tolerated for a week. When a neurologist analyzes a case and finds it in a dangerous condition he says so promptly and if the patient wants a dozen doctors of as many kinds he has no objection. The neurologist is the only doctor who analyzes his cases—all others diagnose; that is, guess, and prescribe one of a great variety of formulae; if it fails to show benefit, they guess again, and so on until the patient recovers or expires; if the former, medicine has won a victory; if the latter, it was a hopeless case. More queer reasoning. I insist it is the duty of the doctors, old or young, to go outside of orthodoxy when, if they have common sense, they know the old drug methods are humbugs.

I want to see absolute freedom of practice extended to all. If any abuse the privilege and practice fraudulently, there are statutes with which to reach them and punish them severely. Then let the public know who they are and they will soon be out of business.

"Live to learn" is a good motto.

Some people are not even good imitators.

Public applause is dangerous—it breeds bigotry.

The consciousness of a duty well done is sufficient reward.

All the advancements in this world have been accomplished by departures from beaten paths.

Personal appearance cuts a great figure in making a success of anything. I don't mean you must be pretty, but you must have winning ways.

"WHERE IGNORANCE IS BLISS."

A Hint to Searchers after Happiness—Be not Afraid—Seek and Find.

Since the fable of the cursing of Adam and Eve for eating of the fruit of the tree of knowledge of good and evil, there have been perpetrated such fool alleged axioms as the one quoted. The world owes whatever of advancement it has made to the vigorous iconoclasts, who have from time to time exposed the fallacy of the wiseacres who were working the "dear people" under the various disguises, from Moses' excursion to the montains to the cheap virtue of Anthony Comstock.

In the days of Socrates if an honest man gave vent to his indignation against the outrages upon human rights he was compelled to apologize to the powers that were, issue a recantation to the "blissfully ignorant" or drink hemlock juice. Socrates chose the latter and became an immortal.

In the days of Thomas Paine, they had modified the punishment to imprisonment and he produced his "Age of Reason" while the state paid his board.

In the days of Ingersoll they did not dare kill or imprison and had to content themselves with ridicule. The Colonel paid them in their own coin and hell froze over, while heaven advertised rooms to let. To-day, almost anybody can get a pass through the pearly gates—if he has money or influence. If he doesn't like the color of the band-wagon they'll repaint it. A young millionaire tells us that Jesus was joking when he said, "it is easier for a camel to pass through the eye of a needle than for a rich man to enter the kingdom of heaven."

In the days current the heretic is so numerous it is practically useless to attempt to suppress him. He is giving full sway to the pent-up inherent Nature which has always been the chief element of him, and he is asking and answering questions with a rapidity and directness that promises astonishing advancement within the next century. Realizing more fully day after day the monstrosity of creeds and dogmas which kept him in the "bliss of ignorance," he is demanding that he undergo the torture of knowledge.

If knowledge is wrong what a volume of pity is due God Almighty! If knowledge is right, and god-like, what a deal of hustling our ancestors will have to do in the spirit-land to make up time lost in the ages gone forever!

Each day brings to me a consciousness of ignorance and lost opportunities and I want to go on record as one who has found no bliss in it. Whatever of positive happiness I have found has been in the acquirement of knowledge and passing it along to my fellow men. But it is so little compared with what might have been that I shall never miss an opportunity to urge others to think, reason, investigate and talk, write and print it.

NEUROLOGY LIKE A PIANO.

It is a Simple Proposition in the Abstract, but It Requires Patient Industry to Win.

Wiseacres who undertake to practice neurology or even that small branch of it known as ophthalmology, without learning it seriatim soon learn that the lesson that "he that vaunteth himself shall fall." Really the philosophy of it is simple; so simple that many of my pupils have become first enthused, then fearful lest their future patients may take up the dietary, for example, and become competitors instantane. This amuses me, because I know they will know better before they graduate and if any patients should be foolish enough to think that the few instructions which apply to one case will reach all others, the error will become apparent when they try it. Such is the case with old-school drug treatment, because if the patient gets the list he can try all the prescriptions in it and if there was any such thing as medicine curing he would surely find it. That is the chief reason the old doctors have to write their recipes in pig Latin, pigeon English and symbols. It is not the case with neurologists. They tell their patients what they give diets for, what they contain and why they are needed, how long to continue, etc. If the rest of the family is sick or well, the same diet can do no harm, but unless other matters are looked after in each case of disorder the best results cannot be expected. I often tell a mother to require the whole family to take the same dietary ordered for her child; at the same time I tell her that if any of them are chronics it will be necessary to have a thorough examination and other instructions. I explain that neurology is like a piano, simple in structure and any one can strike the keys, or possibly pick out a tune, but it takes an expert to bring in the two-hand action and the demi-semi-quavers. The same description applies to those practitioners who attempt to practice without proper and sufficient instruction. They practice like the average musicians plays—well enough to satisfy some people but they give competent judges, even among the laity, a pain. They are boasters; they assume the "air of peculiar reserve," and slowly but surely starve out. It is they who want laws to "protect the dear public" from "charlatans." God save the mark! They are it.

A good skeptic is better than a bad believer.

Some people are smart enough to imitate if not to originate.

Too much time is consumed in promulgating theories; not enough in demonstrating facts.

Judging from current medical literature I conclude the only thing that isn't contagious is common sense.

The fact that popular opinion endorses some things and condemns others is not one whit proof that one is right and the other is wrong.

HOW TO MAKE GOOD DOCTORS.

Keep the Field Wide Open for Competition—The Devil Will Get the Hindmost.

A letter from an Ohio physician telling me he was coming to Chicago to attend my college said: "I will tell you why I haven't been with you sooner. My colleague in this little town is a drinking man and I dared not trust my patients to his care while I absented myself. Recently a new doctor has settled here, and I can now leave and feel that my patrons will be attended properly."

Isn't that pathetic? Isn't it a shame? A good, honest doctor cannot leave his practice to another because the other is liable to get drunk and neglect it. A drunken doctor protected from the possible consequences of his habit by a practice act that "protects the dear people."

I advise the public to beware of the political doctor, (the American Medical Association is a political organization and boasts of it), the drinking doctor, the club doctor and the gambling doctor. The first is a rascal, the second a mentally weak mortal, the third a dubious quantity, and the fourth a financial and professional failure.

No professional man ever knew too much—except in his own estimation. There is so great need of serious application of the mind to problems not yet solved that I cannot see how one who is recognized as a member of any one of the alleged learned professions can stoop to the level of a poker game night after night, or can waste time gossiping at a club or loafing in a saloon or behind the prescription case in a drug store, or dabbling in the nastiness of politics.

It is these classes of doctors and lawyers who need laws to protect them from their betters. It is they who would have all energetic, able, honest competitors declared criminals by fool laws, passed by idiotic or venal legislatures. It is they who would sacrifice public health by vaccination and other devilish devices for the sake of revenue. It is they who continue in old ruts from year to year because they are too lazy to study and learn Nature's ways and wishes, and think because they echo the words and manners of smart leaders, they, also, are smart.

Such doctors are always exploiting operations before mystery-loving laity that doesn't know that only about one doctor in ten can set a broken finger, doesn't know that not one in fifty would dare tackle a laparotomy, doesn't know that the doctor who can relieve without operation is infinitely greater than he who butchers with the delight of a cannibal.

Give them the benefit of publicity.

"Heredity" is one of the worst abused words in our language. It is the scapegoat by which many physicians escape responsibility for failure to cope with congenital defects which they diagnose and treat as diseases.

SERUM THERAPY A CRIME.

Vaccine Virus and Antitoxin Producers of Vile Diseases and Lockjaw. A Bad History.

Consistent with their old practice of holding fast to a theory, even though it failed in practice, because they had no substitute, many old-school doctors stick to vaccination and other serums in spite of the terrible consequences and even seek laws to compel well people to submit to inoculation. With impudence and a stubbornness worthy of a better cause they declare that every case so treated that lives owes it to the virus; while those who die are charged to bad nursing.

A more nonsensical proposition could not be conceived. It is more than nonsense. It is willful, deliberate, malicious falsehood.

England and her colonies tried vaccination and found that the increase of erysipelas and other skin diseases, as well as organic troubles, multiplied with amazing rapidity, and while there are left a few mercenary doctors who clamor for it, the majority decided it was worse than a fraud and laws which tried to compel people to suffer inoculation were repealed.

In our own land, during the civil war out of over 5,000 prisoners in and around Danville, Va., only 2,000 took smallpox when it broke out under the most unsanitary conditions; of these over seventy per cent had been vaccinated and eighteen persons took it who were thoroughly marked from a former attack. I have this history from Dr. J. M. Thurston, of Richmond, Ind., who was the physician in charge.

I know of numerous cases of scrofula produced by it; also blood poisoning, so that the victims lost arms and legs or were scarred about the face for life.

Antitoxin has an even worse record in the brief time it has been exploited. Many of its victims have died from tetanus while there is not a scintilla of proof that it ever saved one case.

The doctors who are its most strenuous advocates dare not attempt to answer the following questions:

If vaccination is an "absolute safe-guard" why do they repeat it?

If it requires more than one vaccination how soon does the first one cease to be efficacious?

If "sufficient exposure" will bring on smallpox in "ten to fifteen days," what constitutes "sufficient exposure?" This is like the test for mushrooms: If you eat them and live they are mushrooms; if you die they are toadstools.

The Chicago health (?) board claims to have a "perfect" system of vaccination which "causes no inflammation, swollen glands, high fever or other objectionable results." How do they tell when it has "taken" then?

If vaccination is a safe-guard why have isolation hospitals, to which they take patients by force?

If the disease is "catching" how is it caught, and where did the first case "catch" it?

If it is carried on the clothes why do not doctors' clothes carry it? They frequently attend cases and go abroad among their patients without change.

If it is preventable why do doctors take it?

The dean of the medical department of the University of Illinois confessed he has been vaccinated sixteen times and has had smallpox twice, does that signify anything in favor of the serum?

Do the people have any rights that such fiends are bound to respect?

In the matter of yellow fever the trust doctors claimed to have discovered the remedy in sanitation at Havana, Cuba, which sounded reasonable, and worked. But now, that an epidemic has raged in the south for weeks, worse than in 1878, they charge it to a peculiar kind of mosquito. This mosquito must be a female of a certain age, must bite a yellow fever sufferer, then incubate for a certain number of hours, then bite its victim. This was the first story which was supplemented by the reassuring statement that this particular sort of female does not bite at night. Later it was discovered they had become Christianized, carried lanterns and bit at night as well as in day time. Then as the fever subsides they are declaring that these cases produced by night bites were not so virulent. As a matter of honest truth the doctors are as much in the dark as they were thirty years ago, and the reason is they are searching along the same old lines.

The most helpful—confidence.

The most irritating—meddlesomeness.

Money will buy anything except brains.

High heels and high collars are the best shoulder braces.

It is not how much one thinks he knows, but what he can prove, that counts.

Conservatism is a good thing, but it is like a mustard plaster—should be applied locally.

Cuss-words are vile, but I know of none sufficiently so to express my opinion of gossips.

Ill people are unable to perform labor, angry ones are careless and tired ones are incompetent.

No theory is worthy of confidence until it has been demonstrated practically and none are so great fools as those who accept and demand that others receive as facts the vagaries of their minds. It was this class who crucified Jesus Christ, who compelled Socrates, four hundred years before that event, to drink poison; sixteen hundred years after persecuted Spinoza, and to this day are seeking to make statutory criminals of those who think and teach and prove their philosophy.

IT IS A DISGRACE TO BE ILL.

Of Course There Are Mitigating Circumstances.—Penalties Are Attached to Violations of Nature's Laws.

Every doctor who has to do with the ill's flesh is "heir" to meet all kinds of sick people, but few are practical enough to know that each case is better than any book, after the rudiments of one's profession are mastered. The tendency is to get into a rut and let matters go willy-nilly. No good doctor has time or inclination for society, for clubs or for sport. That he should take recreation is a matter of law; but that amusement ought to take precedence over his professional duties is one of the most disgraceful ills that could be proposed. The penalty attached is loss of practice and general retrogradation.

In the practice of neurology, more than in any other system, is close application necessary. Our analyses of new cases is augmented or hampered by the mathematical precision, or lack of it, with which we attended previous ones. Diagnosis is good only when it is corroborated by analysis; therefore objective and subjective symptoms, mental and physiological must be observed and careful records kept for study from time to time, in comparison with others. The doctor who does not practice for the love of his work primarily cannot hope to be a success financially—unless he is a rascal—and his failure is one of the disgraceful ills.

The vast majority of doctors are poor in health as well as in worldly possessions, because they lack system in their work. I do not know of any other profession, or occupation, in the pursuit of which so much physical exertion and irregular hours are involved, with so meager returns. Many other businesses are conducted on a strictly cash basis and none do the extensive credit act the doctors do. This is a disgraceful ill of the doctors, and it is a penalty for the violation of the law that "the laborer is worthy of his hire." It is, I fear, one of the chronic ills of the old schools, possibly incurable; but I hope to do much toward removing the cause and neutralizing the effects before I pass hence. I have grilled doctors and their practices, but they will find, ultimately, I am one of their best friends. It is their fault that the present baneful conditions exist. First they take into their colleges immature material, cripples, nondescripts, who have no capital, either in cash or brains, graduate them and in the struggle for a mere existence they teach the public to call the doctor for every little belly-ache, "for it might be appendicitis;" medical societies constantly use news columns of the papers to keep the people frightened, and, life being as sweet to the ignorant as to the learned, to the poor as well as to the rich, they demand the attention, night or day, storm or calm, when they have nothing to pay for it. and when there is absolutely no need to impose on anyone.

The remedy for this is dual: First, let it be published that it is just

as much of a disgrace to be ill bodily as it is already considered to be "off" mentally. Who ever heard anyone boast of an insane relative? When did you ever hear crazy people swapping lies about their vagaries? Second, let it be understood the doctor's fee is due and payable at the conclusion of his visit. He would better get fifty cents or a dollar in legal tender than a three-dollar "I. O. U." This can be done if the practitioners will unite in demanding it. And, even if they do not unite, those who adhere to the rule will have more money, for less work, at the end of the year, than any of the others. They will have less worry, more time for study, better health and be more competent. Of course there are exceptions to all rules and the tactful doctor will make them; but there is no reason why he should work for those who are wealthy and wait years for his pay because he fears if he "duns" the debtor he will lose practice. The sooner I lose the practice of those who can pay but will not, the better I am pleased.

I do as much charity work as the average doctor, but I put it in the charity column. I keep no books, except a cash book. When a patient comes I hear the tale of woe, fix a price for my services and get it; then the work begins. I get the money in advance for two reasons. First, to be sure of it; second, I often voluntarily agree to guarantee good results, provided, always, the patient follows instructions to the letter. By guaranteeing I mean that I am so positive my analysis is correct I will assume the risk of all the money loss if I am wrong. I never have had to refund a penny, because the patient is given to understand distinctly that if directions are not followed my methods of measurement of nerve supply and conditions will disclose any lapses and I will refund nothing. The results are they do as they are told, get the natural benefits and are happy. So am I.

One thing I impress on my patients, above all other injunctions, is: "You would not like to have me going about discussing your condition with everyone I met would you?" Of course they reply "No." Then I say, "Well, don't you do it either. If anyone asks you what is the matter and who is your doctor, tell them that is a private matter which you do not care to discuss; and you may say, if you please, that your doctor taught you it is not creditable to be ill, hence your determination to keep quiet about it." Then I have it understood that so long as the case is in my charge I do not care for the opinions of gossips. When I want advice I know where to go for it. Once I had a case of convergent squint which reported the fourth day with a homely case of divergence. She was very unreasonable at first and made all sorts of threats, backing them with repetitions of the advice she had received from her mother, sisters, cousins, aunts and neighbors. I was bluffed for about a minute, when I bethought me of her father and I asked if he was alive. She said he was, and I asked for his opinion. "Well," was the reply, "He said if you were there you would

probably tell them all to go to the devil." I jumped at that. "You bet I do. Bully for your father. Tell them he struck my sentiments exactly." Then I pushed her gently toward the door, telling her to keep quiet and report in a week with her apologies, the which she did, as happy a girl and with as straight eyes as any.

The mitigating circumstances, when the stain of disgrace does not attach, is when the ills are results of causes over which the victim has no control. But the chronics are never such and have need to be impressed with the facts. Children and the aged are, of course, to be treated with consideration, but all should be made to feel, by delicate explanations that the doctor is conferring a favor when he takes a case, and the duality of duties of the patient is to follow instructions and pay for his services at once.

WHAT'S IN A NAME?

In the Surname, Tradition.—In the Given Name We Have an Index to Character.

I have a very practical friend who represents one of the big commercial agencies. One day he gave me his abstract method of making financial ratings. He said: "Let us take the sturdy name of Smith, for example. 'John Smith, Dry Goods and Groceries' on the sign and letter-heads tells me at once that John is no artful dodger by nature, and all I have to look after is his training, which is usually found to be as steady as the name. I have no difficulty in getting replies to my questions and my work is soon finished. I have his confidence, he has mine and the public rarely suffers by it. If John tells me it is none of the public's damned business what his business is, it is a pretty good sign John is trying to do business on a bluff and he is rated accordingly. If he suffers injustice it is his own fault. When the sign reads 'John Smith and Brother,' it is natural that we learn which particular brother, how much each is interested, if the families are extravagant, etc., but I always feel good when I see such a sign. There is a fraternal feeling aroused in me that makes me favor those people if duty will permit. If the sign reads 'John Smith and Company' it is legitimate but suggestive. It looks to me as if John needed help or was involved in some obligation, and, of course, I must find what it means exactly. Sometimes it means a mighty pretty act of good-heart toward employes, sometimes it is a straight business necessity, and often it is pure rascality. If the sign reads 'The John Smith Brothers Company' or 'John Smith (Agent)' I make my requests for information in the form of demands, much as an officer of the law might. I know I am up against rascals and let them understand it the first thing."

My own experience has shown that while the surname carries family

traditions, true or false, it is rarely an indication of character. Of course when we read of Ulysses Grant III or Marshall Field III, it means that the III, or his relatives or misguided friends, are trying to impress the world that grandpa still lives but has been improved decidedly. Such persons may be very wise, amiable and all that one could wish, but they are presented under disadvantages, to thinking persons. The moment one poses as a distinguished person, just that moment he assumes the responsibility of the position and is expected to stand or fall under criticism. Where is Ulysses Grant II or what does Marshall Field II amount to?

But that is all right. It is only a weakness of the parents in the first place. It is the given names that tell a story, and a true one. In the days when people were not so plentiful they rarely had more than one name. Later two became necessary—the surnames for family connections and the given name to differentiate between members of the same family. Then it became the custom to christen a child with two given names out of politeness to the grandparents of both sides of the house. That was a pretty sentiment but it was “run in the ground” when these prefixes were increased in number until they complimented all relatives and friends and overloaded the society columns of the newspapers later. Like other infections, not attended properly, this plague grew until it became a mark of aristocracy and the mother who had not a sou markee to leave her child named it Algernon Mephistophiles ahead of Brown, perhaps, and died blessing her fool self for having given birth and a name to a prodigy. Then came the “y” and “e” period, when pretty Edith was distorted into Edythe, when Mary Jane was converted into Marie Gene or Mayme Jayne. And yet the fool-killer remained away.

Then came, in quick succession, from the simpering sophomore, Elmore Bennington Brundage, and from the mature nothing, damned fool, or rascal, J. Lewis Edwards, H. Harry Brown, etc. They should put it O. Sissy. And the fool-killer is here. I am it.

My experience with the last-described class, covering a period of thirty years, has been unqualifiedly disgusting. I have no hesitancy in saying that I have known more than a hundred such and have found them every-one either man gossips, weak-minded but conceited people, out-and-out rascals or vascillating creatures who are no credit to society or a school and are a source of worry to their friends. I have therefore issued an edict, based upon an unpleasant experience, that so long as I control the institution I do now no one who uses such an appellation need apply for admission, and if any sneak in they will surely be discovered and dismissed. This applies also to those who are inclined to such snobbish, idiotic practices. My school does not undertake to supply brains as well as education. Now you know what's in a name to me.

OBLIQUE CYLINDERS.

How They Produce Trouble Because They Are Fitted to False Positions.

It is not unusual to find people wearing glasses with the axes of cylinders at oblique meridians. This is because they were fitted by novices or dogmatists who did not know the first principles of anatomy and physiology, physics or practice.

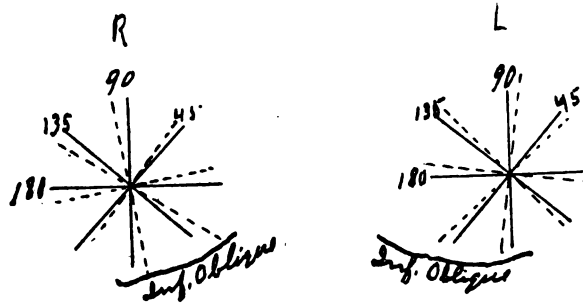


Fig. 103

Fig. 103 shows a case in which there is irritation of the general nervous system to the spasm stage. It is exhibiting in the third nerves' branches to the inferior oblique muscles of both eyes, with the result that they pull enough to rotate the eyes fifteen or twenty degrees, so that the two first principal meridians, 90 and 180, and the two second principal meridians, 45 and 135 are moved to the dotted lines, and the operator, believing it was true oblique astigmatism, fitted the cylinders to those meridians. The spasm is also present in the other branches of the third nerve which operate the lens and much of the hyperopia is concealed. In such cases I have found invariably that not over one-half of the hyperopia was corrected. It is often possible to take these and, while the axes are found oblique when correcting each eye separately, to shift both to 90 or 180 or to the second principal meridians at the moment of permitting binocular vision, thus securing comfort and settling the question at once; but as a rule it is better to prescribe temporary spheres until the nerve supply measures o. k., then it will be discovered the obliquity has disappeared.

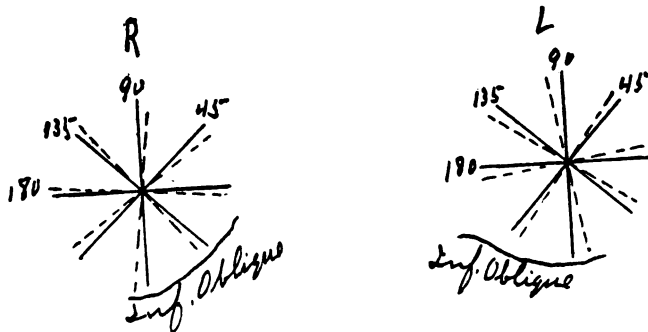


Fig. 104

The same is true of the reverse condition as shown by Fig. 104, when the stage of collapse is reached and the nerve supply being weak, allows the inferior oblique to slack up too much. These cases are easier to control than the first class but caution is always the better part in doubtful cases.

CIRCLES OF DIFFUSION.

How to Find Approximately the Size of Them in One's Own Eyes at Given Distances.

The figure shown herewith is an ideal eye in the matter of dimensions. From the center of the lens to the posterior pole is just the same distance as that from the center of the lens to the line P in front of the eye. This line, then, represents the principal focal plane from which rays starting divergent would pass beyond the cornea and lens parallel with the axis. The ray R would be refracted and focus at the posterior pole because it ap-

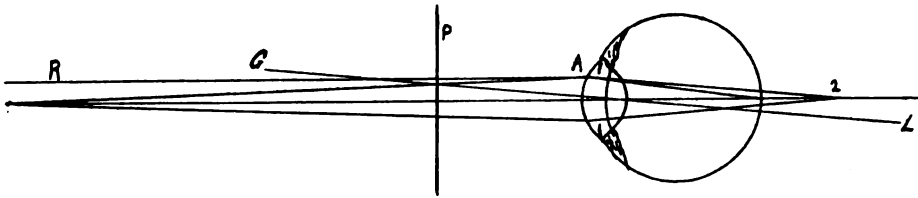


Fig. 105

proaches parallel with the axis. Now, while the eye is fixed on a distant object let another object be placed at farthest point to the left shown on the axis, which is just three inches. The ray from the point, which strikes the cornea at A would be refracted and pass away parallel to the line G L and would strike the axis at 2 if it could get there, as would also its fellow ray below the axis. But as neither can get past the retina, the circle of diffusion formed will have a diameter equal to the space between the two lines at the retina. This shows exactly what the circle of diffusion would be in a hyperope of 13.00 D. with accommodation at rest.

An interesting fact in this connection is that the circle of diffusion from the distant rays would be just as great if the eye was adapted to the three-inch point. The same is true of any two points. To make it plainer, if the eyes are fixed on a point, say thirteen inches distant, rays from a point forty inches away would form circles instead of points. Then reverse the proposition and fix at forty inches; the rays from the thirteen-inch point would form circles of the same size. The first ones would focus before reaching the retina and the others would reach the retina before focusing. Of course if some critic wants to split hairs he would declare the rays that focus before reaching the retina will make a trifle the biggest circle, but I will anticipate him and reply that he fails to consider the increased angles

of the rays from the nearest point which would increase the dispersion enough to offset the other.

There are a number of physical problems having reference to the eyes that afford physiological and metaphysical lessons which more than repay one for studying them. No one in practice pays enough attention to the laws upon which he works, whether it be physician or tradesman.

PTERYGIUMS AND CATARACTS.

Their Causes and Suggestions for Their Rational Treatment.

A pterygium is designated technically as a vascular thickening of the ocular conjunctiva. The conjunctiva is the membrane that lines the lids and covers the anterior portion of the globe, including the cornea; the part that lines the lids is the palpebral portion and that which covers the globe is the ocular portion. These growths are the products of irritation of the nervous system, produced from within by the strain of attempting to overcome hyperopia, and from without by the presence of fine dust, which accumulates in the nasal canthus because the flow of tears carries it there. The irritation of the nerves increases the heat in that vicinity and nature proceeds to build more blood vessels and to enlarge the ones already there in order to keep the membrane cool. They are easily arrested, if taken before they get too much of a start, by correcting the hyperopia, if any exists, and by using strong salt water with a delicate atomizer, twice a day for several days. Sometimes they disappear entirely. If they are neglected too long, and grow up over the cornea they impair vision permanently. Some malignant cases of long standing have to be dissected away. Fig. 100 shows one grown to the edge of the cornea.

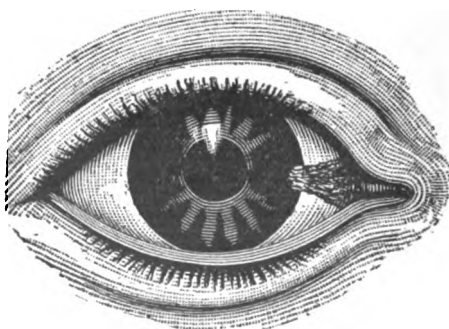


Fig. 100

Cataracts are opacities of the crystalline lens. They are of several forms, from that of a spider-web to a solid mass. The latter are seen easily and appear under an oblique illumination as a milky spot just behind the pupil. Congenital cataracts are those which exist at birth and are usually as white as ivory; traumatic cataracts are those caused by blows

and they may mature in a night; senile cataracts are those which come in the eyes of old people from the systemic changes incident to their age.

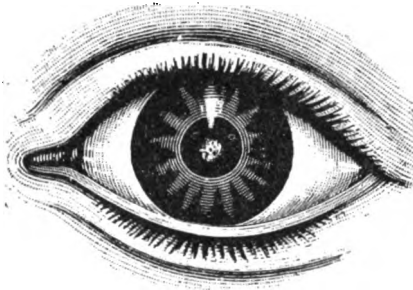


Fig. 101

Formerly the only remedy was operation and that often failed to restore sight because the retinal connections with the brain had become atrophied from non-use. It is not advisable to operate as long as the other eye is usable.

Some success has been had from the use of *succus cineraria maritima*, some from oil of *thuja occidentalis*, and some from a saturated solution of common salt. It requires about three months to make the latter. All of them are used in the same manner, that is, a drop on the cornea, just above the pupil, three times a day. They enjoy about the same per cent of success as do other chemicals, medicines, etc., and no one knows why they work when they do or why they fail when they do that. Fig. 101 shows a cataract partly developed.

A BIT OF HISTORY.

The Humble Origin of the Physician and Surgeon of the Arrogant Old Drug Schools.

Of all professional or tradesmen in the world I know of none who are so exalted, in their own estimation, and in the estimation of the public, as are the masses of physicians and surgeons. They strut about like turkey cocks at breeding-time and make themselves obnoxious to all sensible people. In the first place the truly great are never ostentatious. Second, the vast majority of the above described mass, while graduated as physicians and surgeons are neither in fact and never can be, because they lack common sense. Third, even the most expert surgeons make the most egregious mistakes and only the great bookkeeper knows how many lives have been sacrificed by these errors. I have made errors, but I never vaunted myself until this moment when I declare I am a greater surgeon than Drs. McBurney, Murphy, Senn and the rest, for the simple reason I am able to save people whole, and with Nature's aid make them well, while the class named delight in the scalpel and disregard utterly the mortality feature.

This bit of history was recalled to me recently when I heard a young squirt from a local old-school college sneer at a neurologist who had been a barber, then studied osteopathy and electricity, found them wanting, and took up the study and practice of neurology as expounded in the school of which I have the honor to be the founder. The aforesaid "squirt" is a measly little cad about five feet three inches in height, with a face that would frighten a tom cat on a dark night, and a flow of language that suggests the car barns or newsboys' alley. The doctor he was sneering at was six feet two, as erect as a telegraph pole, with as frank a face as ever looked at a patient, a born doctor if ever there was one. Comparison of the two would be likening a tumble-bug to an arch-angel.

I haven't much use for barbers, myself. I regard them as a rule in the same category with milliners—gossips, but, having a faint recollection that the barber is a very ancient species I looked up his record and found that he existed away back in the days of Ezekiel. The University Encyclopedia tells the following story about him:

Barber (Barbo, beard. From Latin *barbator*, to cut the beard.) "This trade or profession is very ancient and is mentioned by the prophet Ezekiel. (Chap. v. 1.) In China and other oriental countries barbers shave the whole or part of the head. The practice of shaving the beard was common among the ancient Egyptians, Greeks and Romans. Among the ancient Israelites the removal of the beard by shaving or plucking it out was a sign of mourning. In former times barbers served the public in the capacity of surgeons and performed the operation of bleeding. The spiral red stripe seen on the barber pole is said to symbolize the winding of a ribbon around the arm previous to letting blood. In London the barber surgeons formed a corporation with certain privileges. They were incorporated in England in 1461 and were united with the surgeons in the reign of Henry VIII (1509 to 1547). The connection was dissolved in the reign of George II (1727 to 1760) by an act, the preamble of which affirms that the trade of a barber is foreign to and independent of the practice of surgery.' Quite recently the surgeons of the Swedish navy were also barbers for the crews."

Therefore if it is a disgrace to have been a barber, how much more outrageous is it to have sprung professionally from a race of barbers.

Let us all cultivate that modesty the seriousness of our position demands, and when we hear a surgeon say he would rather operate than eat, avoid him as an insane man.

Pay as you go and you'll go farther.

Reason and education are the most dangerous enemies of religion and drug medicine.

People who misconstrue the action of others, or who gossip on the strength of unjust suspicions about matters which do not concern them, are beneath contempt.

NEUROLOGISTS MUST SEE PATIENTS.

Whenever One Undertakes a Mail Order Business He Is Not a Neurologist.

Before me lies a book called "The New Field," just received from a friend, and on page 68 I find an endorsement of a specialist whose specialty is "to know what to name a disease and what will cure it without seeing the patient, or hearing or knowing more than his P. O. address." And the author, after saying this doctor is "one of the most learned men we have," added: "Any man, to command such a patronage must be a successful man."

I weep for that author's ignorance. If you don't believe it, come to me and I'll show where I sit while I weep. I know lots of such "successful fellows." One of them, in Kansas City, who has been so successful that he quit taking city patients because he was too busy counting money that came by mail from suckers, told one of his friends recently, that he would have to get up a new graft as the old one was about worked out.

All of which moves me to say that to practice neurology the doctor must see his patients, must take nerve measurements, analyze the diet and figure out the whole line of treatment, just as carefully as an architect figures his plans.

Our system of analysis, applied to that specialist's professions makes us ask why it is necessary to know his patients' post office addresses. When I start to be a liar, I'll go whole hog or none. I'm not ready to start yet, however.

COLOR IGNORANCE AND BLINDNESS.

The First Named Is Very Common, While the Other Is Exceedingly Rare.

A practical test of color perception is to ask a great many people to name the color nearest white and keep a record of the replies. It will be found that men and boys know very little of colors and tints, while women and girls are usually well-informed; but even among the latter will be found many who insist that pale yellow or cream-color is the nearest white, when the fact is pale green is correct, because green is the central color of a spectrum; pale blue is below it and pale yellow above, if the prism which separates the elements is base down. Pale blue is where the lower dominates and pale green is where the central color prevails, hence the difficulty in distinguishing between the two.

No test for color-blindness is complete until a persistent effort to educate the subject fails. Of course there are cases so well-defined that it would be safe to bet they could not be educated, but I have seen such who learned readily after correction of errors in their dioptric systems. That there are genuine cases of absolute color-blindness has been proved abundantly, and of course the phenomenon calls for explanation. The old propositions that the rods and cones of the retina have to do with it by pos-

sessing three sets of color-perceiving elements, red, green, and blue or violet, and that there exist three different visual substances, red-green, blue-yellow and white-black appear fallacious to me because I am sure the consciousness of vision is not in the retina any more than it is in the cornea or lens, because the so-called dioptric system simply causes an image to be formed on the retina which transmits the impressions to the brain much after the same fashion a counting machine registers on paper in its interior the effects of pressing on external keys.

In the physical portion of this work I have shown how an aplanatic lens is constructed and how the combination overcomes chromatic and spherical aberrations. Natural philosophy teaches that there is nothing artificial that has no original in Nature, therefore in looking about for the original aplanatic lens we find it in the crystalline humor of the eye; while its structure is liquid it is striated, like an onion, beginning with a bi-convex nucleus it is completed with negative menisci, the whole forming a bi-convex lens enclosed between the anterior and posterior capsules. As the artificial product accomplishes certain things, it is reasonable to conclude Nature made the crystalline in the same manner for the same purposes. I hold, therefore, that absolute color-blindness is due to the mal-structure of the crystalline.

One may be absolutely color-blind from abnormal index of dispersion in the lens, yet have no errors of refraction, but vision could not be normal because of the dispersion.

Other evidence that color perception is a part of the sensory nervous functions is that many blind people have shown their ability to distinguish color by touch. I once knew a man in Natchez, Miss., whose eye-balls had been enucleated when a child, who could, and often did, tell the color of different roses by touching them so lightly the petals were not injured. He could also tell the color of one's hair in the same manner. Others have reported similar cases.

One of the most delicate corroborations of my duality discoveries is in this color sense. On five pages following will be found the same figure printed in different colors. The figures are set well toward the top so the space below can be used for the transfer. To try the experiment there must be good daylight and by fixing the eyes steadily on the eye of the figure for a minute or two, then fixing on the center of the open space below at the spot marked, the complementary color, or duality, will manifest itself. If the figure observed is,

Black, white will appear.

Red, green will appear.

Green, red will appear.

Yellow, violet will appear.

Violet, yellow will appear.

And if the figure be in white on a black surface, black would appear when the transfer of the gaze occurred.

It will be found some people note these changes quicker than others, the complementary color often appearing as a border around the figure as the eyes fix on it. Those who are unable to see the change at all, even after repeated trials, day after day, have evidenced that their color perception is not normal. But that is not remarkable any more than it is that many people cannot learn music or other refined arts requiring delicate sensory apparatus.

In applying the principles upon which I have pursued my studies, the following solution of color dualities presents itself:

All laws, or causes, are accompanied, or succeeded, by effects. White is a combination of all colors; black is the absence of color. One is positive, the other negative in nature. In the spectrum, we have red, orange, yellow, green, blue, indigo and violet as the "seven elementary colors" of accepted authorities. The red is a decided element, while the orange and yellow are similar, green and blue are in the same relation, practically, as are also indigo and violet; therefore in red and yellow we have the +, or acute, elements and in green and violet we find the —, or benign, elements. Of the +, red is the extreme and of the — violet is. In all positive chemical compounds the major portion being + dominates the minor portion which is —, and in all negative combinations the major portion being — dominates the minor portion of +, hence in the departures from perfect combinations, which would form white, if the major or + portion is red, the minor or — portion would have to be green, and if the major portion is yellow the minor portion would, necessarily, be violet. Then it follows, as a matter of course, that reversing the proportions of elements would reverse the positions of the principals. The extreme + element combines with the least — and the extreme — combines with the least +, qualitatively, and which is to dominate in any combination is a matter to be settled quantitatively.

The complementary relation between color and sound is illustrated by the red scream of a frightened child and the black roar of thunder.

That the senses of smell and sound are complementary has been proved in the great perfumery houses of Detroit, where they have what they call the gamut of odors, regular musical staves, treble and bass, on which, instead of notes, are written the names of odors. A pianist improvises a sweet little melody and when the odors corresponding to the notes are combined in the same proportions the decoction smells as it sounded when it came from the piano. I mention this here, out of place, because I have no other place for it and it is a fact worth investigating, particularly by those whose esthetic tastes are already highly cultivated; it would be tedious to others.















THE MATTER OF CLOTHES.

Remarkable Progress From Mother Eve to an Iowa Doctor Who Wears
a Gown.

It is still an unsettled question whether Adam or Eve devised clothing. But it appears both wore the same kind and that very décolleté. If they could return to earth and see the Dubuque, Iowa, doctor who wears a mortar-board cap and a gown during office hours they would be more ashamed than the records state, I am sure.

Nature clothed animals with hair and mankind with mentality, and when she sees what fools the latter make of themselves it is remarkable that a second flood does not occur. It is not my purpose, however, to write of fads here, because the space at my command is limited.

Clothing, since the two suits of our first parents has not grown on trees. It has been the product of the ingenuity of man. At first it consisted of a simple mantle draped about the body to protect it from cold and heat, while the feet were protected by soles of wood held in position by straps of skin. The ancient rulers and the members of their courts attired themselves gorgeously, exposed their "charms" in a lewd manner, and put in their leisure writing codes of morals for their imitators of to-day. These codes were interspersed with histories of their practices which modern generations are more prone to emulate. The modern society woman's gown begins just above her nipples and extends ten feet to the rear. She discounts Ajax by defying pneumonia at one end and microbes at the other. She parades her nakedness with absolute abandon and is inexpressibly shocked if a man appears in her presence in a shirt-waist. Oh! inconsistency; thy name is Fashion.

It is not how much or how little clothing one wears, but the manner in which they do it that offends decency. To the person with a practical mind who realizes that he is not his brother's or sister's keeper, except to the extent of not imposing on him or her, a perfectly formed man or woman, naked or clothed, is a natural object of interest. To people whose minds are filled with false modesty, the marble statuary in the salons of the world are terrifying. It used to be said of Boston women that they wore glasses from modesty, not wishing to exhibit their naked eyes.

The man with a practical mind, knows the fashion indulged in by many women is deliberate, malicious and outrageous, not only imposes upon Nature, but upon the natural feelings of her fellow men. It is, first, in clothing heavily one part of the body and leaving absolutely naked the part containing the lungs, bronchi and throat, endangering life; second, by exciting carnal desires unnecessarily and impudently without any intention of gratifying them.

Woolen clothing, especially underwear, is advocated by some, because they say it absorbs the perspiration. We ask, "What do you want to ab-

sorb it for?" They reply, "To keep cool." We ask, "How often do you change it?" They reply, "Anywhere from twice a week to once a month," owing to the social status. We say woolen underwear should be changed daily if worn at all. Thin people in delicate health say they wear it to keep warm. We ask, "Does it do it?" They reply, "No," but insist that if they wore anything else they would freeze to death. We ask, "Did you ever try it?" They say, "Of course not, because I'm alive." We reply, "You'd better try it, it will at least put you out of your misery, according to your philosophy."

Society decrees that dudes and dudeens shall wear heavy wraps in summer, but the same blamed fools will wear full dress in mid-winter and have the audacity to wonder why they get sick.

From a neurological standpoint underclothing is worn as a protection to the outer clothing, as it is easier to wash and is less expensive. It should be of rather light weight all the year, because the outer clothing can be changed in weight suitable to the weather. There are occasions when it is advisable to carry extra clothing, just as there are when an umbrella is a good thing. In any event the person who wears clothes takes a preponderance of chances because they are all artificial. It is a very common thing to see a baby or child, and even some grown persons, poked into a sack, feet and all, to go to bed, when everybody, young or old should, rationally, have part of the twenty-four hours absolutely free from clothing, except that furnished by the sheets, etc., on the bed, which may be pulled over in emergency. I sleep as naked as I was born, every night, with a sheet and sometimes a blanket if the night is cold.

If anything, man is a worse offender in the matter of dress than women, except in the one particular, that his lungs are not exposed; but he wears more clothes and does not keep his shape or form as well. He wears low, flat-heeled shoes, hence requires no attention to keeping balanced; the result is he gets round-shouldered. He puts on an undershirt, an over shirt, a vest, a coat, while the woman has a little vest for an undershirt, a cheese-cloth shirt-waist and a little piece of ribbon for a tie. The man wears woolen or balbriggan drawers and more or less heavy trousers. The woman, if she is sensible, wears short stockings, roomy muslin drawers, with possibly a very light skirt under the dress skirt, to protect the dress. Then she wears a corset, which has been the subject of many anathemas. She needs it for two reasons: First, her skirts are supported by the hips and fastened with a cord or band which could easily be made too tight and cause distress; second, if her breasts are developed, as they should be, they need support, on account of the lack of training to develop the muscular tissue to hold them steadily; third, the corset being laced properly around the abdomen, supports the viscera and relieves the pressure in the lower pelvic region; fourth, it holds her straight so that she does not get round-should-

ered. Then she wears shoes with reasonably small heels and rather high, which assist in keeping her straight. When she gets the French heels, set in the middle of the feet, they not only endanger her ankles but she acquires an unnatural gait that instead of being attractive is disgusting and pitiful.

But, after all, clothes make the man, in the estimation of a large majority, and to be successful, even a neurologist must adhere to certain fashions, although he need not be foolish. Professional men for generations have worn frock coats. The reason is, they are semi-dress and as doctors, particularly, are making calls constantly, or receiving callers, it is only a matter of respect to their patients; therefore in order to avoid being conspicuous, all doctors will and should continue the practice. The silk hat, however, is a mistake and a discomfort. It was invented by some devil to be worn by coachmen, and the dress suit was devised for waiters.

The whole principle of clothing is for protection from atmospheric changes and from traumatic incidents. If we make the clothing of good material it will protect us from the latter when comparatively light. If we make it so that it can be put on in layers we can adjust the number to the temperature, but on general principles, the nearer natural we are, the better our health. One of the evidences that we have direct from nature is in the fact that we rarely see a baldheaded woman. One of the reasons is, unquestionably, that she lets her hair grow, while men cut theirs. The other, probably more important, is that she wears no hat.

The hands are taken care of better than the feet. They are left naked, except in excessive cold, while the feet are constantly incased in not only cloth but leather and sometimes rubber on top of that. Is it any wonder they raise a stink? They need extra care at least in the evening, when they should be bathed as soon as the covering is removed, and to avoid extra tenderness they should be rinsed in cool salt water.

PHYSICAL DEGENERACY.

Many Examples of It Are Found Among Those Who Profess to Practice Healing.

"By their fruits ye shall know them" is one of the old time axioms that is consistent with reason. But when we pause to look at the physical effects of Christian civilization and medicine in comparison with many "heathen" peoples we blush at our assurance in assuming superiority. The reason so few blush is that few think. Both Christianity and medicine have always taught we must allow others to do our thinking—those God's anointed fellows who do not have to show credentials because they are ready to admit their position.

Reader, set up, if you can find space in your mind, an ideally perfect physical man and woman. Then look around among the people you meet and find how many are up to the standard. Or, better still, take those

whose physical attractions have impressed you favorably and examine them with reference to proportions of development. In the first search you will find slouchy, pimply-faced boys, girls with wrinkles like aged persons, breastless women and haggard men, with round shoulders, as the most conspicuous features. In following the second suggestion you will find an improvement over the others but you will find they are decidedly below standard and will discover that their attractiveness to you was in their mentalities.

Physical culture fads will never supply the remedy, for two reasons: First, they are not conducted for benefits except to the conductor; second they do not go to the cause of the troubles but merely treat effects; third, they often do harm; fourth, when they do not affect the body harmfully they make mental nuisances of their votaries.

Speaking strictly there are no laws of health. There are laws of Nature, which, if obeyed will keep us all in perfect health. We must know the chemistry and mechanics of those laws, the chemistry and mechanics of the body, and we must know them all, not necessarily in minute detail, but in the gross sense. Neurologists hold that they are in no danger of starving because the public may learn too much. Indeed we know from practical experience that the more we teach our patients about themselves the more they want to know and the better patients they are. Old school doctors dare not practice our tactics, even if they knew enough to do so. And, by the way in this class we find lots of degenerates.

ATTEND NATURE'S CALLS.

Unnecessary Retention of Urine and Other Excrementitious Matter Is Unhealthy.

Some reader has remarked, long before he reached this article, that I am a fault-finding person. But I doubt if it ever occurred to him that the chief object of the work is to remove causes by first pointing out what they are; then the second object is to offer rational methods of restoring health where old-school methods have failed, and to show how health may be retained when it has been established.

One of the commonest faults of civilized people is neglect to obey Nature's hints that she is ready to empty bowels or the bladder. Thousands of men, women and children, suffer torture daily by reason of a false modesty which prevents them from making their necessities known in the houses of friends or in public places. They insult their Creator rather than offend (?) a host or tell their trouble to a policeman. If this is not a fault, this book is a failure.

The complementary fault in this instance is that in small towns and in the country the closets are cold, exposed places, where the act of evacuation

is done under most unpleasant conditions, hence is avoided as often as possible. To the class of people who object to many of my propositions because "animals do not do so," I now say: Here is one matter in which animals set a pattern worthy of emulation in one respect, at least.

Closets should be warm as a living room and should be supplied constantly with means of flushing and with soft tissue paper. It is part of life that food be taken and waste discharged. If the latter is not done it soon interferes with the benefits of the former, because normal organic action depends upon harmony of action in them all.

NATIONAL DISEASES.

The Same Baneful Influence That Outrages Individuals Works Collectively in Politics.

In the year 1896 the chief political issue was the remonetization of silver. The Republican party could not endorse the avowed principles of the Democracy, but its managers, realizing that the latter had a strong position before the voters, adopted a platform declaring for bi-metalism, which they told the people was a better proposition than "Bryanism," and, with their customary credulity, enhanced by their doubts about the integrity of the Democratic party and lots of money judiciously distributed, the voters gave an overwhelming vote to the Republican candidates. As soon as congress convened a law was passed effectually settling the question by establishing a gold standard. But, fearing a revolt on account of their perfidy, the Republican managers, who were, in turn "managed" by those who were to profit exclusively by the new order of things, again flooded the country with money and cries of "fifty-cent dollars" in 1900 and 1904. As I write this book the results are panning out. The rascals who debauched the country, saw a handwriting on the wall and began to plunder with impunity in order to amass fortunes while the opportunity lasted. They became intoxicated, and, like all other drunken people, exposed themselves.

The big insurance companies, whose heads were the most vociferous gold standard howlers, insisting they wanted to "protect" their policyholders, and thus appealing to the tenderest spot in the voters' hearts, have been pocketing millions which according to right and law, should have been placed to the credit of the patrons of the companies. One president of a big insurance company admitted he gave \$150,000 of the trust funds to the Republican campaigns mentioned above, and declared he did it because he thought it his duty to do so to "protect" the owners of that fund from their own votes! The insolence of it is only comparable to the hold-up man who explains that he robbed his victim to prevent him from spending his wealth foolishly. But that is not the worst of it. Leading

Republican editors of the country printed endorsements of the crimes in which they admitted they were not lawful but declared were right, because they saved the people from "free silver."

In the next campaign it will be hard to convince the voters that a fifty-cent dollar is worse than a two-dollar dollar, or that a Democrat is worse than a Republican thief.

As a matter of fact that fifty-cent dollar story is the veriest bosh. Nature made everything that is upon a double standard and maintains it dually. No nation or person violating the natural laws of order can remain in good health.

And when disorder occurs it requires a duality of remedies, that is, remove the cause, then neutralize the effects. We have, in National, state and municipal offices a lot of blood-sucking politicians who care no more for the public than they do for Mexican peons; they are insolent, lazy and thievish. Associated with them are the big, brainy fellows, who take the big profits while the puny office-holders take the leavings and the "glory." This duality is the cause. It must be removed. Then, to neutralize the effects the new incumbents must be controlled by simple, strict laws. They must be taught that faithlessness to their trusts is treason which will be punished without stint. Those who do business in this country under the protection of its laws must be taught that when they become enemies to its principles or give aid and comfort to its enemies they are traitors and will be banished or beheaded. Circulars issued by the New York Life Insurance Company during the American-Spanish war read as follows:

Rules for Americans—During the first year of the continuance of this policy, if the insured shall die when engaged in the naval service of the United States, or while engaged in the military service in the tropics, or in consequence of such service, the amount paid under this policy shall be one-tenth of its face. The foregoing restrictions will be waived if the insured, immediately upon entering the naval service, or before leaving the United States upon military service, shall pay to the company at its home office an extra premium equal to 5 per cent of the face value of this policy.

Rules for Spaniards—The New York Life Insurance company declares by these presents that it annuls, under the present circumstances, the restrictions respecting the service in arms contained in the life policies issued to Spanish subjects. Therefore, what Spanish subject soever who may have a policy in force in the New York Life may, without fear of prejudicing his insurance and without paying other premium than stated in the policy, accept military service during the present war. He may consequently be sure that in the event of his death in war the company will not refuse to pay the insurance on the life of one who died in the performance of his duty. The company declares further that all possible facilities will be given to the Spanish insured in order that they may keep the policy in force.

If said holders of policies should find themselves in difficulties regarding the payment of their premiums at the time they become due, the company will make loans for the payment of said premiums whenever the value of the policy permits.

What do Americans think of that, to be allowed to pass unpunished? See constitution of the United States.

All these questions must be settled by one of two great parties. Let honest, thinking people get together and let it be known that they will pay for breaches of trusts by crushing the criminal, politically, socially, financially and physically. Then do it.

CHOP-SUEY PEOPLE.

A Class Whose Mentality Is Sadly Deficient—Aptly Termed Moral Perverts.

This class of humanity is composed largely of women who are ambitious to appear adventurous and up-to-date. They would be adventuresses if they possessed more brains. They are not dangerous, except to young girls whom they may induce or permit to accompany them. They are, as a rule, religious to a turn, but they want to see the slums and the only way to get there without adverse criticism or absolute condemnation is to take up the chop-suey fad. Only a Chinaman knows what the stuff is and only the female curiosity and idiotic recklessness on the part of her male escort could stand for the surroundings and food.

It may be all right, once in a lifetime, to visit the low quarters and see how the "other half" lives, but when these visits become frequent and a topic of boastful conversation, it strikes me as proof the boasters really belong in that quarter and are out of their bal-li-wick in my company. Just why a Chinaman's grub and society are more desirable than those of negroes is not clear to me, although the chop-suey class would be insulted if invited to a negro restaurant. In the pursuit of my profession, at various times in my life I have visited chop-suey joints, opium joints, sporting houses, saloons, gambling houses, jails, churches, etc., but I never lingered in them longer than was necessary. I smoked opium once, for an experiment, and have been "tight" when I was in the sophomore stage of life, but I have never eaten chop-suey, had a venereal disease or been a member of a church.

If people choose to be in that class it is none of my business farther than I have a right to express my opinion from the purely professional standpoint of a neurologist and metaphysician. I can see no benefits to be derived. I can see how weak characters are made weaker by association, just as they are made stronger by contact with their superiors, and it appears logical that the chop-suey fiends, more than all others, need guardians.

CATARRH A DISGRACE.

It Means the Person Who Has It Is Not Cleanly, Either From Ignorance
or Carelessness.

There is no more necessity for the existence of nasal caarrh (and there is no other kind) than there is for fleas on a dog. It is a shame that people have not been educated, ridiculed, bulldozed, if necessary, into a knowledge of the fact that the nasal passages are the only openings in the body which have no doors, consequently are always open to the accumulation of dust and other irritating bodies. Possibly I should make exception of the mouth, for some keep it open voluntarily all the time they are awake and it remains that way involuntarily when they sleep. Teach the child to sleep with its mouth closed, even if it has to be tied shut. This will teach it to breathe through the nose as Nature intended. Then teach it to snuff water up the nasal passages every time it washes its face. Have it use salt-water once or twice a week and it will never have catarrh, which is merely a suppuratory effort on Nature's part to get rid of the irritating presence of the foreign matter. For those who have been neglected until the alleged disease seems well-rooted the same salt-water treatment, practiced persistently, three or four times a day will yield in six weeks or less. A teaspoonful of salt to a glass of water is not too strong. Hurt? Yes, of course, it will hurt. The parts are raw. Keep it up until it quits hurting; then you know it is well. Catarrh is an internal eczema and we would treat it in the same manner we do eczema if we could get the cloths on the inside.

The young man with catarrh who calls on his girl cannot hope to win her respect or love, if they are worth winning.

The girl who receives company with a whiff of catarrh breath need not expect them to call again if they are of a class worth knowing.

If I should be invited to name the unpardonable sin I would respond promptly and name it catarrh. Because there is positively no excuse for it.

FEVERS AND DIARRHOEA.

Two Simple Methods of Treatment that Work Like Magic.—They are
Purely Mechanical.

Pick up any old materia medica or a current medical journal of the drug schools and they supply abundant evidence of the uncertainty of their methods in the numerous prescriptions for the many "fevers" (we know only one) and for the diarrhoea which is so common in such cases.

Our method is to seat the patient on the floor, get the left fore-arm under the chin, being careful to avoid pressure on the throat, the right hand at the back of the head, low down, and pressing forward to hold the head erect, then lift the patient bodily from the floor. This will stop a fever caused by a cold, in about half a minute to five minutes. If the

fever is from nerve pressure somewhere else (it is always from nerve pressure), we must find it. Then, for diarrhoea we seat the patient on a chair or stool in such a position we can get our knees in the small of the back, about the lower dorsal and upper lumbar vertebrae, then pull back gently by the shoulders. Two or three minutes of this will be sufficient to stop any case. If it is a baby with summer complaint, let it lie in bed, pass the hand under its back at the proper place and lift gently, but far enough to put on the pressure. The first of the operations described relieves pressure at once and permits the nerve current to resume its normal sway. The second first arrests the short circuit which is causing trouble, then permits the regular rhythmic action to go ahead. Of course one treatment is not always sufficient, but as a rule it is. If it is not, repeat until it does the work.

COLD HANDS AND FEET.

A Weak Pulse Is No Evidence of a "Weak Heart," But Due to Nerve Obstruction.

No one who has cold hands and feet constantly is healthy, and drugging for such symptoms is rank idiocy.

One of the most imposing things the old-school doctor does is to feel the pulse (the other is to look at the tongue). If it is feeble, out comes the strychnine, digitalis, dynamite, etc. It is unnecessary to go further; that patient is in a serious condition; the more money he has the more serious the case.

Neurologists know that the wrist is no place to find out what the heart is doing. They go straight for the heart and they do not need a stethoscope (what a word) either. They know that cold hands and feet mean the nerve current is not circulating in the appendages as it should and they furnish the motive power to work out the joints, where the pressure may be, and while they are at it the spine is given a few gentle twists. They never hurt anyone. They know that if the heat nerves are not working well the vaso motor nerves are also involved and they just use common sense. After a few exercises the extremities grow warm and remain so until something the patient does upsets the nerve connections again.

These manipulations are not osteopathy. That is a rough treatment. I have in my classes now a woman who says she matriculated in the Kirksville school of osteopathy last winter, and received treatment for spinal trouble during three months, when she abandoned the school because she could not stand the rough manipulations. She is delighted with neurology.

Remember that bacilli are not the cause of diseases; they are the effects.

He is either a rascal or a coward who does right either through hope of reward or fear of punishment, here or hereafter.

THOSE "WASTING DISEASES."

A Class of Cases Old Methods Cannot Reach—Give the Neurologist a Chance.

Many of the so-called "wasting diseases" have always been and are a puzzle to the medical fraternity, yet few have attempted to go outside of beaten paths in their treatment, and when they have done so, they have sought more powerful "remedies" than were used previously. only to meet failure again. They are unable to understand why simple treatment can possibly win, and refuse to try it. For example, when quinine and arsenic and other dope has failed to relieve ague, they would have a conviction fit if told to give a teaspoonful of common salt fifteen minutes before breakfast several mornings. Yet it is as much of a specific as ever was found, because it has a natural affinity for the blood and supplies the deficiency in the elements which was the cause of the "disease." We neurologists have watched it with the ophthalmoscope and can note the changes in the blood from day to day.

The neurological method comprises a working knowledge of the chemical composition of the body, of the foods it lives on, and a practical system of analysis of each case which discloses the relative proportions of the elements present, so that when one or more is lacking we can supply it by changing the food from day to day until not only the quality of the blood is improved to standard, but the nerve supply also measures up to its standard. The physician who is not familiar with the ophthalmoscope (direct method) has no means of determining the condition of the blood that is worth mentioning, and dumping in tincture of iron and strychnine is too slow, uncertain and dangerous to be worthy of consideration.

The average physician does not seem to realize that the chronic case is the most serious of all. He is on a par with the average patient, who, while a terrible grouch, does not think he is ill enough to cease work until he gets to the point where he cannot leave his bed. As a matter of fact, persons with acute troubles either die or get well quickly, and there is no way of telling whether the doctor's treatment killed or cured. The patient might have died just as easy without the doctor, or he might have recovered as readily if there had been no doctors within a hundred miles.

It is a common thing for persons with "weak lungs" and "weak hearts" and other symptoms of general debility to declare they haven't consumption. And they may be right, often are; but, if they do not take the proper treatment in time they will soon get into a state where it is too late. Common sense would suggest that inasmuch as consumption is only a name for symptoms of general decline in vitality, it might be well to take such simple treatment as can do no possible harm and may do immense good; but few people have common sense. The very ones who

declare angrily they have no disease are constantly in a state of alarm and bite eagerly on every patent nostrum that is advertised; then they condemn rational systems without investigation or trial, as if it really did them good to take their spite out on some one or some thing.

We do not solicit patronage. We want it understood that when we take a case it is we who are doing the patronizing. We are conferring the favor. Were it not that we cannot live on air we would not think of charging anyone for our services, but the fee is not all of the cost of our treatment. We require of our patients self-denial, practical application to the study and understanding of their own conditions, the reasons for their existence, the reasons for everything we order them to do, and the reasons why they cannot hope for results if they do not obey orders.

No person, young or old, whose physical or mental condition is below normal should eat potatoes, fine flour bread, patent foods, sweets, chocolates, cocoa, pastry, nor indulge in liquors of any kind. They may eat eggs, oysters, fish or ham, well cooked, game, fowls, veal, mutton, peas, beans, corn and tomatoes. But the trouble with sick people is they do not know how to eat. They resort to drugs to create unnatural appetites. They eat at the wrong time. They eat too much. They do not take variety. And we cannot tell them in a general way. Each case needs at least one thorough examination and analysis to disclose the exact stage of progress of the disorder, then after following our instructions for a short time the analysis is repeated and the figures compared with the first one when the results show for themselves. No patient is asked to take our word for anything. It is an ideal system, because it is practical, and is practical because it is natural.

Skeptics are privileged to make themselves ridiculous by ridiculing us, because they could not be expected to endorse something they know nothing about, and some assume, because they are failures, everyone else must be.

The scarcest—common sense.

Call a bluffer every time you get a chance. Nothing will rid the world of them so quickly.

Infinity is that which is beyond human comprehension. The origin of the universe; the future of the human race; the measurement of nothing; analysis of the mind. All that is thought or written of such subjects is wasted, except as it brings us inadvertently upon practical, finite lines. As a means of comparison it is questionable because of the needless and harmful controversies resulting. If one declares a proposition true because no one is able to disprove it, that one is treading dangerous ground. Such were the tactics employed in ancient times when people were governed by superstition; and no other mark passed down the generations is so often in evidence nor so baneful in its influence.

KNOWLEDGE VS. EDUCATION.

Reason Has Always Had an Up-Hill Fight Against Great Numbers of Superstitions.

"Truth springs eternal in the human breast," sang the poet; probably not realizing what he was singing about. Had he given the matter a second thought he would have discovered that the reason truth is eternally springing in the human breast is that its very soul revolts at the false training of the human mind which has cost more health than all other causes combined. False notions about everything—eating, drinking, clothing, amusement. Beginning with the false notion that to be happy hereafter one must be melancholy here, for to be happy here meant hell hereafter, the education of the generations has been deliberately perverted from the natural to the imaginary; from the wholesome to the stale; from the inherent good to the exherent bad. They have been taught that "man is prone to evil as sparks fly upward," which is a lie. A lie that has bred distrust, and has arrayed mentality against mentality, even in the same individual. Truth springs eternally to the front, only to be crowded back by a misfit education which is the opposite to knowledge.

Of all things I have accomplished in a busy life the one of which I am absolutely proud is the emancipation of my mind from the superstitions of my ancestors and of most of my contemporaries. I now think without fear or favor; I analyze my thoughts and reach conclusions which are as clear as the noonday sun; to those who really think I can give expression and not be misinterpreted; to those who are still fast in the bonds of the dark ages I give only a part, which, of course, they misconstrue. Some people can read between the lines because the scales have been lifted from their eyes. To them I have redeeming qualities and I thank them for their confidence. I know them, too; though they think I do not. Then there are other some who think I am a quarrelsome old ogre with long hair and whiskers, and claws, and tusks. The first class know, with me, the rascality and cowardice of the herd, and they love to see me wield the lash in my paper and with me see the puppets squirm. The second class fear the publicity I give them, their holier-than-thou pretenses, their love of the "dear people," and they dodge and cast insinuations which they dare not put into plain language. They know themselves as cowards and they know I know them. I fear them not; they fear me. Why? Because they are victims of ignorance in all that the word implies. They fear to let truth get the ascendancy. I do not. I encourage it.

Don't eat so much—you'll feel better.

Talk not, unless you have something to say—better think.

If one knows a thing, he can prove it. If he only believes it, he is a chump.

STIMULANTS—NARCOTICS.

One of the Greatest Evils of Our Time Is the Drug Habit. Absolutely Experimental.

One of the paradoxes constantly on view is that of the anti-whisky people who are constantly patrons of the Nerve Tonic and Antikamnia counters of the drug stores. They inveigh against the saloon-keepers until they are exhausted, then hie themselves to the nearest drug store and buy a bottle of "Restorer," or a handful of headache powders. It is too bad that physicians dole out as much as they do but when the public begins to prescribe for itself the druggist begins to buy automobiles.

Stimulants and narcotics are the same devil; one is the obverse, the other the reverse side. Cut him open and you will find one devil inside—he has a duality too. See?

The drug stores do infinitely more harm than the saloons, because they are regarded as respectable. Of course they do not have the rough crowds of loafers, but any child can get a prescription filled without question, or it can buy headache powders or almost anything except arsenic, opium, and a few other things. The little ones learn from their parents that for the effects of dissipation a big dose of "bromidia" is a stimulant, so they take it, take another whirl, repeat, etc., until they are beyond the limit angle, when they whine and blame the doctor who cannot repair the damage in a day or two.

A small dose of a narcotic is a stimulant. A big dose of a stimulant is a narcotic. Beware of both.

Neurologists have the battle of their lives in inaugurating an era of drugless medicine. To be successful they must have their own way with every case. It is Reason and Education against Superstition and Ignorance. But we stand on solid rock while the others are on the sand.

SOURCE OF BODY HEAT.

Healthy People Suffer From Neither Heat Nor Cold.—The Reason For It.

These little five-minute communications are given for the purpose of inculcating the idea of topical study and to illustrate the correlation of things. If the reader will put the ideas into practical use he will do much toward establishing order and proving the simplicity of Nature. You may have observed that some lean and some fat people suffer from cold and heat while others do not. Inquiry and tests will develop the fact that those who feel atmospheric changes keenly are short of nerve supply. The matter of being too fat or too lean is not an ungovernable idiosyncrasy, as many imagine. They are in their respective conditions merely because they do not eat right, with reference to both quality and quantity. No matter how much one eats, if he does not digest and assimilate it there can

be no fat; and if he eats the fat-making food in such quantities that it is taken into the system it may make excess fat, but in the absence of the muscle and nerve elements the natural result is weakness from the overload and lack of power.

Then physiological defects and habits may add to the complication and dire trouble follow. The physician who does not know the mechanics and chemistry of the body is as much in the dark as his patients.

No matter whether one is fat or lean, if his nerve supply is deficient he will feel extreme atmospheric changes. Even those who are perfectly well will feel the cold, for example, on going out in the morning immediately after rising, when the day current is not yet turned on. To prove this, go out some morning when the thermometer registers about fifteen or twenty degrees above zero, without first eating, and note how the cold pinches. Then try it the next morning, with temperature the same, but eat something first to start the digestive apparatus going, noting the difference. The reason is clear; Nature is a true economist. When the need for the stronger current ceases the current shuts off automatically and must be turned on again, or both sensory and motive powers will be deficient. If it is there to turn on all is well; if it is not there all is wrong. Again I assert that the nerve system is the sole source of heat and power, that that blood is to distribute elements needed for tissue building, and muscles are the mediums through which power is applied.

WHAT NIGHT SWEATS MEAN.

They are the Natural Product of Physiological Strain and Are Easily Controlled.

Among the stubborn things the old school doctors meet, few are more persistent than night sweats. However, they permit the patient to go about, if he can, and continue to treat until the case gets beyond control and the undertaker does the rest.

To the neurologist they mean the patient is below the danger line and analysis always proves the correctness of his diagnosis.

The voluntary current during the waking hours of a hyperope of 1.00 D. is 23 per cent above the average capacity of his machinery. This strain combined with other physiological excess demands will, eventually weaken the tank-supply of the most hardy and when the demand ceases, during sleep or when the person lies down for a few hours, the residue is not sufficient to keep the sympathetic or involuntary current going to the sweat glands, their mouths open and the perspiration pours out. Sweating is not a cause of weakness. The weakness is the cause of the sweating. Like many other things, both doctors and laity have this thing wrong end foremost.

The neurologist corrects the errors of refraction, the diet, the habits

and requires absolute rest, which is the only rational way to give Nature, the only healer, a chance to work. We often meet the objection that patients do not want to wear glasses. We meet it by asking if they would prefer being invalids without glasses to being strong with them. Thus given the choice of two evils only fools would choose the greater. I am ashamed to be compelled to say many physicians ridicule people who wear glasses and declare it a fad. I have even seen books in which the authors declare they diagnose cases by the eyes and yet never give a hint that they know anything about the possibility of hyperopia and the damage done by efforts to overcome it. Some go so far as to assert that good vision proves the eyes perfect, thus establishing their criminal ignorance.

HOW THE BLOOD CIRCULATES.

The Arterial and Venous Systems—Things the Student Must Have Well in Mind.

Arteries and veins are formed of three coats each: an internal, serous, or membranous layer; a middle, muscular layer, and an outer, fibrous layer. The vaso-motor nervous system operates them. The arterial action is a continuous, rhythmic motion, as the heart beats start the waves one after the other, hence this system needs no valves. With the venous system it is a different proposition; the blood is flowing toward the heart in them, but the propelling force is not so direct, therefore Nature has provided valves, like canal locks, or check-valves in water and steam pipes, so that when the compression forces the blood out of one valve it goes into the next one toward the heart. The vena-cava, hepatic, portal, renal, uterine, ovarian, cerebral, spinal, pulmonary, and the minute capillaries of the venous system have no valves because the larger ones are emptied by the action of the organs with which they are connected and the small ones by the action of the larger.

These vascular systems are connected with each other, and their branches with each other, so that the blood finds its way readily to every part. This connection is called anastomosis. Following is a list of important arteries and their branches:

Aorta, from left ventricle of heart, gives off two coronary branches just behind the semi-lunar valves, which supply the tissues of the heart; then comes the arch or thoracic aorta, from which branch the innominate about (1 1/2 inches long), the left common carotid and left subclavian; next comes the abdominal aorta which branches into the two common iliacs, the coeliac axis, superior and inferior mesenteric.

Innominate, from arch, divides into right common carotid and right subclavian.

Common carotids divide into the external and internal carotids, and in

some disorders the external may be seen pulsating rapidly as they pass up the sides of the neck toward the ears.

Subclavian, go to the neck, thorax, brain.

Common Iliacs, from aorta, branch into external and internal iliacs, which supply the lower limbs, the pelvic and generative organs.

Coelia Axis, from aorta, to stomach, liver and spleen.

Mesenteric, superior, from aorta, to small intestines, caecum and color.

Mesenteric, inferior, from aorta, to descending colon and rectum.

Auricular, from external carotid, to ears and scalp.

Axillary, from subclavian, to brachial.

Brachial, from axillary, to radial and ulnar.

Radial, from brachial, to forearm, wrist and hand.

Ulnar, from brachial, to same as radial.

Palmer, from ulnar to palm and fingers.

Internal carotid, from common carotid, to forehead, eyes and nose.

External carotid, from common carotid, to jaws, tongue, ears, external head and the brain.

Iliac, external and internal, from common iliac, branches to femoral.

Femoral branches to popliteal.

Popliteal branches to anterior and posterior tibial.

Anterior and posterior tibial branch to dorsal pedis and plantar to toes.

The four last lines refer to the supply of the hips, thigh, legs and foot.

Epigastric, from external iliac, to abdominal wall.

Femoral, from external iliac, pudic, to procreative organs.

Facial, from external carotid, to pharynx and face.

Mammary, from subclavian, to breasts.

Occipital, from external carotid, to neck.

Ophthalmic, from internal carotid, to eyes.

Pulmonary, from right ventricle, to lungs.

Sciatic, from internal iliac, to muscles back of pelvis.

Thyroid axis, from subclavian, to muscles of shoulder, neck, thorax, spine, etc.

Temporal, from external carotid to ear, forehead, etc.

Vertebral, from subclavian, to neck and cerebrum.

There are, of course, veins corresponding to the arteries described, but there are some features of the venous department with which the student should familiarize himself. Some of them, particularly at the base of the skull are enlarged canals into which the blood from the various parts of the head and brain empty and if they fill more rapidly than the jugular and subclavian can carry the blood away, there is pressure on the nerves, headaches, strokes of "apoplexy" and sometimes hemorrhages, then clots on the brain and paresis or death.

The jugular and subclavian veins gather the blood of the upper extremities and pour it into the innominate veins which unite to form the

superior vena-cava. The right innominate is $1\frac{1}{2}$ inches long and the left is 3 inches; the superior vena-cava is 3 inches. The internal iliacs gather up the blood from the feet and legs and deliver it to the common iliacs which unite to form the inferior vena-cava.

The pulmonary veins carry fresh blood from the lungs to the left auricle of the heart into which they empty through from two to five openings.

The portal vein is formed from the union of the superior and inferior mesenteric, splenic and gastric veins; it delivers crude blood to the liver through two divisions, and after it has passed through the ramifications of that organ, it is sent through the hepatic vein into the inferior vena-cava.

The venous system is, therefore, divided into four departments, the Pulmonary, the Systemic, the Portal and the Hepatic: and when the student knows the particulars about these he is in pretty fair condition for an argument or practice, so far as they are concerned.

DISTRIBUTION OF NERVE FORCE.

One of Our Practical Procedures in Handling an Average Case.

The first essential in handling any machine is to know its capacity. But no machine will stand working up to its full capacity, and in this respect the human body is not unlike other machines; therefore we want its average capacity, which we learn from nature by ascertaining the normal demands upon it by the best means at our command; this we find in the eyes when they are normal, and as such eyes are scarce we take the ideal schematic eye for the basis of our calculation; thus in emmetropia the demand equals only the sympathetic supply for distant vision; for near work, 13 inches.

For accommodation, L. 3.00

R. 3.00 total 6.00 D.

For auto-convergence L. 1.50

R. 1.50 total 3.00 D.

Grand total 9. D. per second.

$9 \times 60 \times 60 \times 3 = 97,200$ D. in three hours' work.

Add for other branches of 3d, for 2d, 4th, 6th and $\frac{1}{3}$ of 5th, 2,800, and we have a total to the eyes of 100,000 D. daily, for $4\frac{1}{3}$ pairs of nerves to the eyes. As this is one-tenth of all the nerves in the body the same ratio would mean 1,000,000 D. daily demands for the entire body.

Dividing this 1,000,000 according to our judgment, from the relative labor the various parts perform, we get the following:

Eyes, via 2d, 4th, 6th and 1/3 of 5th nerves	100,000 D.
Cranial viscera	50,000 D.
Thoracic viscera	150,000 D.
Abdominal viscera	400,000 D.
Arterial and venous systems	100,000 D.
Sympathetic and glandular systems	50,000 D.
Appendages	100,000 D.
Incidentals not included in the above	50,000 D.

Total 1,000,000 D.

An important subdivision of this is the abdominal viscera.

For the stomach	50,000 D.
For the liver	100,000 D.
For the spleen and pancreas	50,000 D.
For the kidneys	50,000 D.
For the bladder and procreative organs	50,000 D.
For the intestines and mesenteries	100,000 D.

Total 400,000 D.

One of the chief points in our practice is in knowing how to determine when any of the departments of the body are overtaxed. The first named, the eyes, are the only ones in which we can find the exact conditions, but by their showing we are able to treat all the others in such a manner as to be on the safe side, so that no possible harm can result and the greatest opportunity for Nature's good offices is afforded. We can sometimes render further assistance by adjusting and manipulating joints and muscles thus the whole story in a nutshell is simple, but to do all these things requires a more thorough understanding of normal anatomy and physiology than is taught in old-school medical colleges, and to this we add physics and personal skill, which embodies gentleness above all other things.

This brings us to conditions as we find them. The eyes are the gauges through which we get accurate data, and as it gives us a basis upon which to figure all kinds of errors, we take a hyperope of 1.00 D., which shows the actual excess demands above the average capacity as follows:

For accommodation,	L. 1.00	
	R. 1.00	total, 2.00 D.
For auto-convergence)	L. .50	
	R. .50	
For negative pull,	L. .50	
Via 6th nerve,	R. .50	total, 2.00

Grand total, 4 D. per second

$4 \times 60 \times 60 \times 16 = 230,400$ D. in 16 hours, or just that much more than the emmetrope.

The fact that we use the same estimate for the balance in both emmetropia and hyperopia gives us, by the law of ratios, absolutely an increased demand in hyperopia of 23.04 per cent, by any rational system of figuring.

In making calculation for any other amount of hyperopia, all that is necessary is to substitute the amounts under the subheads, Accommodation, Convergence and Negative Pull, with this exception, that when the case is a compound one, such as

$$L + 2.00 - 1.00 \text{ ax. } 180$$

$$R + 2.00 - .75 \text{ ax. } 180$$

we take the + spheres as they come from the trial frame, ignoring the cylinders, and put under Convergence 1.00 for each eye and Negative Pull, 1.00 for each eye. Or if the prescription as it comes from the trial frame is

$$L + 2.50 - 1.50 \text{ ax. } 180$$

$$R + 1.50 - .50 \text{ ax. } 180$$

we proceed in one of two ways: first find which is the fixing eye by having the patient look at a distant object with both eyes open, place his finger against his nose, then push it straight away to arm's length, holding it so that it is directly between him and a light placed twenty feet away, then cover the eyes alternately and note which eye is in line with finger and light; if either is, it establishes which is the fixing eye, and we base our calculation on the assumption that both eyes are accommodating the amount of that one's error. Thus in the above case if the right eye fixed, we assume that the accommodation in each is 1.50, but if the left eye fixed we would use that figure for each eye. If neither eye fixes, the light being displaced as much for one as for the other, we simply add the two spheres together and multiply by two, thus splitting the difference between the maximum and minimum possibilities. We thus get at the total nerve strain very closely.

In myopia the way we calculate nerve strain is to find the patient's usual reading distance without glasses, measure the distance in inches, then find his correction and calculate, as follows:

Suppose the usual reading distance is six inches, but the test shows he is a myope of only 2.00 D.; we know from the fact that he can not read at twenty inches that the convergent act brings with it automatically accommodation, thus shortening the distance of his far point until he reaches the limit angle of the automatic relationship, hence he must be using energy as follows: For convergence, L. 3.25

$$R. 3.25 \quad \text{total, } 6.50 \text{ D.}$$

$$\text{For auto-accommodation, L. } 4.50$$

$$\text{Less his myopia, R. } 4.50 \quad \text{total, } 9.00 \text{ D.}$$

$$\text{Grand total, } 15.50 \text{ D. per second}$$

$$15.50 \times 60 \times 60 \times 3 = 167,400 \text{ D.}$$

This is on the proposition that he works at close work three hours daily. Now by correcting this patient with about — 1.75 so as to be sure and not overcorrect, it reduces his strain to practically that of emmetropia. Of course the extra demands in myopia are only temporary while in hyperopia they are constant, hence it is rare that we find a myope suffering from the troubles which are found so commonly associated with hyperopia.

Where one eye is hyperopic and the other myopic we of course base our calculation upon the hyperopic eye, and a quick way to get the total strain per second is to multiply the + sphere by four.

In making the myopic calculation, if the test discloses compound myopia, allow only for the spheres, but if it discloses simple myopic astigmatism, allow for the cylinder as if it were a sphere.

In the matter of the thoracic viscera, the heart and lungs, we may observe respiration and the heart-beats by listening, and calculate the abnormal strain if they are running too fast, but as that might be only temporary it would scarcely be satisfactory, and in many of our patients we will find weakness exhibited, hence they are only diagnostic symptoms.

The cranial viscera afford the mental symptoms.

The arterial and venous systems exhibit externally and by the ophthalmoscope, and being associated with the heart will partake of its weaknesses, which are of course caused by a weak nerve supply in the cerebellum.

The sympathetic and glandular systems exhibit the secondary effects of the nerve supply and show externally by pimples and deposits of granulated chyle.

The appendages, arms and legs, exhibit in cold hands and feet, also numbness.

The abdominal viscera is where the most emphatic disorders occur; the acute forms produce serious pains and considerable damage from shock, but when they assume a chronic form they are less dangerous, although in a way more important, because the victims not only suffer but they force everybody around them to participate.

Overloading the stomach also imposes on all the other organs associated with it, not only requiring a greater effort to perform the work, but even then it is not performed so well, hence the return or product with which to replenish the supply in the nerve tank is not nearly so much as it would be if less food had been eaten and digested perfectly. Almost everyone eats too much, and they eat the wrong way.

We have given the abdominal viscera 400,000 units to run it normally. If the patient was eating twenty-five per cent more food by his old method, it certainly demanded twenty-five per cent more energy to run his machinery, hence if the 400,000 estimate is right he must have been demanding 500,000, so we have gained the difference. Then by changing the

quality of his food to that which yields more muscle and nerve elements we calculate the gain in this way: First, we reduce the carbons seventy-five per cent; second, we increase the nitrates and phosphates one hundred per cent; in other words, instead of four points carbon to one of nitrates and phosphates we have two points of nitrates and phosphates to one of carbon, a gain of one hundred per cent. in the latter and a reduction of seventy-five per cent in the other, making a net gain in the whole of twenty-five per cent, but when we figure that in the reduction of carbon we have reduced the labor from 400,000 to 100,000 units, and increased the product with which to replenish the nerve supply one hundred per cent, with practically no increase in the demand for nerve supply to handle it, it is safe to count the net gain fifty per cent. Therefore if the case has been demanding 500,000 units daily to do 400,000 units worth of work poorly, and we have saved half of it, he will now do the 400,000 units worth of work with 250,000 units, leaving the extra 150,000 to replenish the tank. In connection with this if we require the patient to take a vacation from his daily work, thus saving at least fifty per cent of the amount assigned to the appendages and to the cranial viscera, we contribute another seven and one-half per cent, and by regulating his habits, etc., we can see where much more supply comes from and it is not at all marvelous that we get the results we do.

It is equally clear that if the patient fail for any reason to follow instructions, these savings cannot occur. This point must be impressed absolutely.

It is a very common thing for a patient to report that if he eats a light supper and is up late at work or pleasure, he gets hungry and cannot sleep. While he is under treatment he must not be up late, but if he gets hungry in the night and awakens, he should get up and eat a cracker and an apple, drink a glass of water and go back to bed. After he is discharged well he will not have those attacks, because we increase the meals up to an average that will obviate all such chances.

The next question that arises is how much food and exercise is sufficient to maintain a production of a million units daily. Six pints of + foods, half of it water, milk, tea, coffee or lemonade, is sufficient. The — foods would never do it in any quantity; it is not in them.

Briefly, we make part of our nervous calculation at the first examination, then we make the other parts from time to time as the case progresses until we find by the final examination that the machinery is running normally, the alleged diseases have disappeared, the patient is gratified and wiser, and we discharge him cured.

Always remember that by the old systems was produced the old adage, "The love of money is the root of all evil," and the way we utilize it for good is this: We charge a big fee and get it in advance, so that the patient's

love of getting his money's worth will force him to follow instructions. Thus we reverse this proposition as we have been doing all others throughout this work, and make the love of money the root of all good.

GANGLIA AND PLEXUSES.

The First Are Semi-Independent Nerve Centers and the Second Are Networks Formed by the Branches.

The chief ganglia of the nervous system are the cerebellum and the medulla oblongata. What is known commonly as the sympathetic system comprises two chains of ganglia located on either side of the spinal column, connected by branches; it begins at the medulla and ends in front of the coccyx. Then, in the anterior portion of the trunk the branches form plexuses, which are also connected by smaller branches, thus completing a double circuit. It is through this system the involuntary current is distributed and in case of vertebral luxations which put enough pressure on the spinal nerves to interfere with circulation, these supplementary lines are utilized; but the wattage is necessarily reduced and the organic disturbance is great. When the old schools learn this fact the osteopath will have no place in the field because he knows little else.

The cardiac, carotid, cervical, diaphragmatic, semi-lunar and suprarenal are the principal ganglia after the cerebellum and medulla; they are distributed respectively to the heart, carotid arteries, lungs, stomach, liver and kidneys.

The cardiac, carotid, cervical, coronary, hypogastric, prostatic, pulmonary, sacral, solar and vesicle, are the chief plexuses. The familiar "solar" plexus is situated just behind the stomach and is formed from branches of the pneumogastric and splanchnic nerves; the first affords direct and the other indirect communication with the brain, so that shock or strain is sure to be reported promptly. This plexus is really a combination of the coeliac, gastric, hepatic, phrenic, renal, splenic, supra-renal, spermatic, superior and inferior mesenteric plexuses.

The cranial nerves are really rooted in the medulla. They have numbers, names, functions and distributions as follows:

1. Olfactory (sensory), to nose; twenty branches.
2. Optic (sensory), to eyes; form retina.
3. Motor-oculi (motion), to all eye muscles, save two; eight branches.
4. Trochlear (motion), to superior oblique of eyes.
5. Trigeminus (m. & s.), to jaws, face and eyes; three branches.
6. Abducens (motion), to external recti of eyes.
7. Portio-dura (m. & s.), to face, ears, etc.; many branches.

8. Auditory (sensory), to ears; two branches.
 9. Glosso-pharyngeal (sensory), to tongue; six branches.
 10. Pneumogastric (m. & s.), to lungs, stomach, heart, liver, etc.
 11. Spinal Accessory (m. & s.), to the tenth.
 12. Hypo-glossal (motion), to tongue; several branches.
- The spinal nerves are in groups according to the vertebrae from which

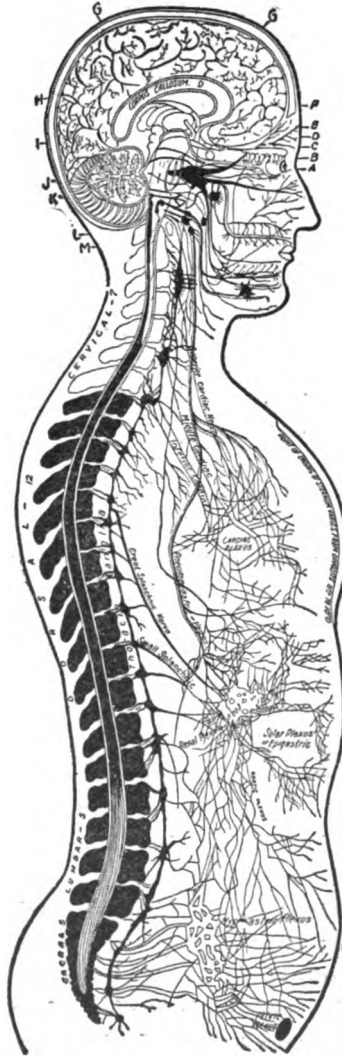


Fig. 106

they come; 8 cervical; 12 dorsal; 5 lumbar; 5 sacral, and 1 coccygeal. They appear on each side of the spinal column and each has its anterior and posterior divisions. The latter go to the skin and muscles of the back

while the former supply the internal apparatus. Some of the more important of the anterior ones have ascending and descending branches.

The first four cervical form the cervical plexus, go to the upper extremities and send some branches to the thoracic viscera.

The other four cervical and the first dorsal form the brachial plexus, which lies in the neck; these do the chief work of the upper extremities and supply the pectoral muscles of the trunk.

The dorsal plexuses, superior and inferior, supply the skin of the trunk and abdomen, the intercostal and abdominal muscles.

The lumbar plexus supplies the hypogastric and inguinal regions, the procreative organs, the legs and feet.

The sacral plexus supplies the sciatic, pudic and assists the lumbar plexuses.

The coccygeal plexus is where the double chain of ganglia complete the circuit. This is why injury to this region from falls, etc., often produces neurasthenia to such an extent that the coccyx has to be removed so Nature can form new connections.

Reference to Fig. 106 will be a reminder that the pneumogastric and splanchnic nerves are the most important of all; it will also show how easily trouble can be caused by luxations of the 4th to 12th dorsal vertebra. A luxation is a minor dislocation.

CYCLOPLEGICS, MYDRIATICS, MYOTICS.

Something About Drugs for Which the Neurologist Has, Occasionally, a Little Use.

Cycloplegics are drugs which dilate the pupils of the eyes and break down spasm of the ciliary nerves. Mydriatics are those which only dilate the pupils. Those commonly used are: (1), Atropine, an alkaloid of *Atropa-Belladonna*, or *Deadly Night-shade*; (2), Homatropine, a product of Atropine; (3), Duboisine, from *Duboisia Myoporoides*; (4), Hyoscamine, or Scopolamine, from *Scopolia Japonica*; (5), Daturine, from *Datura Stramonium*; (6), Gelsemine, from *Gelsemium Sempervirens*; (7), Cocaine, from *Erythroxylon Coca*.

Those in most common use are Atrophia-sulphate and Scopolamine. They are often used in solution of 2 to 4 per cent. The objections to their use are: (1), the length of time required to secure complete mydriasis; (2), the discomfort to the patient from the effect on the general system which it enters via, the tear-duct through the nose and throat; (3), it does not keep longer than a couple of weeks; (4), the dose is unavoidably inaccurate as to strength.

Homatropine, combined with Cocaine, and put up in gelatin disks is the most satisfactory of all because, (1), the accuracy of the dose; (2), it keeps

indefinitely; (3), it acts quickly; (4), there is absolutely no danger in its use.

The disks, as put up by chemists, and kept by all wholesale drug and optical houses, are in bone boxes or glass bottles, each containing fifty disks. The stock numbers of the ones most used are:

No. 338 Homatropine and Cocaine, $1/50$ grain of each in each disk. One disk in each eye, under the upper lid (which should be everted and the disk placed on the conjunctiva, so it will be above the apex of the cornea), will smart slightly for a few moments, during which time the eyes should be kept closed; after twenty minutes the pupils will dilate, and in about one hour the patient should be unable to read ordinary print at any distance, but it does not totally paralyze the accommodation as I have shown elsewhere in this book. The effects pass away in about twelve to twenty-four hours, and there are none of the after-effects which are so common in the use of the solutions.

No. 336 Homatropine $1/500$ grain, is used as the other; dilates the pupil for ophthalmoscopic examinations, and may be used on old people to enable the physician to examine cataracts in order to ascertain their condition.

No. 323 cocaine muriate, is a local anesthetic, used to deaden the conjunctiva while foreign bodies imbedded therein are removed. Takes effect in about six minutes, and passes off in about twenty minutes; dilates pupil for several hours. As soon as smarting ceases after inserting, go to work on the object.

Myotics produce artificial stimulation to the sphincter muscles. Those most used are Eserine, Calabarine and Physostigmine, all Alkaloids of Calabar Bean.

No. 331 Eserine $1/1000$ grain to the disk is used as the others, except for the opposite effect. In some instances of iritis with spasm of accommodation there is danger of the iris adhering to the lens, and if it does, Atropine is used to pull it loose, alternating it with Eserine to prevent mutilation of the membranes. Again, in myosis, or enlarged pupil from inaction of the sphincter muscles of the iris, Eserine is used in the effort to stimulate it to action.

They are worthless except in tonic spasm where there is danger of adhesion of iris and lens, or where the cocaine is necessary to permit the removal of foreign bodies. I have never had occasion to use a myotic.

QUADRALITY OF MAN.

He must be Intelligent.

He must be Brave.

He must be Generous.

He must be Honest.

The longer one travels in the wrong direction the farther he gets from the point he thinks he aims for.

BACILLI AND THE DOCTORS.

An Expert Opinion Secured Several Years Ago, Which Seems to Apply To-Day.

In the year 1900 I was fortunate enough to overhear a conversation between two Irish women, one of whom gave the following with reference to the pet fads of the medical trust, microbes and antitoxins. I secured it verbatim and give it here that it may be preserved for future generations. Said Mrs. Gilhooley to Mrs. Finnegan:

"It bates all, Mrs. Finnegan, what the doctors do be discoverin' from toime to toime these days. Ye naw it was long ago proved be dhrafts on their imagination or some other equally reliable headquarters, that maany diseases come from a bug they call a mickrobe—just why the fling at the Irish Oi dinnaw, but that's what they calls thim just the same. And they're small bastes—tin thousand of thim in wan dhrop av blood, and each wan lousy with smaller wans.

"How do they git in the blood? Well, that's the paart Oi'm comin' to. It's the most wonderful thing that's happened since Assculazarus discovered medicum doctorum.

"Away over in England, where most trouble begins, near the town of Manchester, there was a farmer with a lot av sick childer, and he thrun the rayfuse on a manure pile. The childer had the bugs, or the bugs had the childer and tired av thim and took the first opportunity to leave, Oi dinnaw which, but no mather, the manure pile got the bugs and whin the first frost come made it so hot for thim they moved on by way of a layer av sand underneath and crawled to the river four miles southeast. From there they swam along down the Hudson till opposite Sing Sing whin they obsarved a dairy faarm and wan av them says, 'Oh! oh!' or words to that effect, 'here's a chanct for fun.' Then they all left the river through another layer av sand, and made sthstraight for the well on the place and concealed thimselves in the dhrops of water so that whin the milkman came to fill up his cans they'd be in it, d'ye see?

"Pritty soon ivery man, woman, child and poodle dog in that town had bugs—an' don't forgit the quantities av thim, Mrs. Finnegan—tin millions for ivery dhrop av blood in their poor bodies. That's a heap.

"Well, wan o' thim perfessors of the New York board of health saw it in a rare opporthunity to do something great for humanity and make a name for himself with the possibility of havin' a holiday set apart in his memory, like the good St. Patrick, so up he comes to Sing Sing and catches a few bugs in a bottle. Then he thought he'd out-Pathrick the blissed ould saint himself by bottlin' thim all, but he soon gave that up on account av the scarcity av help, the majority av Englishmen and Americans bein' busy

in South Africa, the Philipeens and Chiny, and he didn't want to thrust the Germans, becuz they're some buggins themselves, so he tried killin' av thim wid asafidity and other truck, but the people wouldn't stand fer that, sayin' they'd as soon live in the stock-yards district at once and fer all.

"Thin he hits upon a scheme that he is shure will work. It is to catch as many as he can with the assistance av the rest av the docthors in the new company he has organized, tame thim and put thim into well people by the hypodrumic injunction and whin the wild divils come there'll be throuble becuz the old residents 'll resint the intrusion, and—hesto! presto! Kill-kenny cats. D'ye see, Mrs. Finnegan? It's a mane thrick to play on the tame wans, but as the docther says, 'the manes justifies the ind'.

"He's organized a company composed av all the docthors, or nearly all av thim, in towns where there is boards av health—for that is the place where the greatest danger is, Mrs. Finnegan—they are goin' to have a law passed to make everybody take in the tame wans whether they want to or not, then they're goin' to make more money than the Standard Oil Company.

"Where did the English farmer's childer get the bugs in the first place?

Why, Mrs. Finnegan, how can you ask such a question? Don't you know the devil's in an Englishman, anyhow?"

SOME OPTICAL STATISTICS.

Interesting Data Which Offer Suggestions to the Ambitious Practitioner.

As the two greatest faults among oculists and opticians are that they rarely get on enough + and often give too much — lenses, the following statisitics are given just as they come from my files, and are the findings in 428 consecutive cases aggregating 856 eyes:

Simple hyperopia,	387, or about 45 per cent.
Compound hyperopia,	287, or about 33 per cent.
Simple hyperopic astigmatism,	44, or about 5 per cent.
Simple myopia,	41, or about 5 per cent.
Compound myopia,	32, or about 4 per cent.
Simple myopic astigmatism,	7, or about 1 per cent.
Mixed astigmatism,	58, or about 7 per cent.

Exactly 50 per cent were astigmatic. Of these 428 eyes there were, of

Simple hyperopic astigmatism, 44, or about 10 1/2 per cent.

Compound hyperopic astigmatism, 287, or about 67 per cent.

Simple myopic astigmatism, 7, or about 1 1/2 per cent.

Compound myopic astigmatism, 32, or about 7 1/2 per cent.

Mixed astigmatism, 58, or about 13 1/2 per cent.

In nearly all cases there was the so-called muscular imbalance, which disappeared soon after the correction of the errors; some at once. Of

course, in addition to correcting the eyes, rest and regulation of habits was required for the worst cases. About 80 per cent showed exophoria, (the other fellow called it esophoria), and the rest were either orthophoric or exhibited esophoria, (the other's exophoria).

Of 161 pairs of + spheres prescribed, 27 were weaker than + 1.00; 85 were + 1.00 to + 1.75; 35 were + 2.00 to + 2.75; 8 were + 3.00 to + 4.00; 6 were + 4.00 to + 11.00. Of these 161 persons, 25 were anisometropes.

In 18 pairs of — spheres 2 were — .50; 1 — 2.50; 2 — 3.50; 1 — 4.00; 2 — 5.00; and 10 were anisometropes.

In 37 cases of oblique hyperopic astigmatism 25 required + compounds for both eyes; 11 required 1 + compound and 1 sphere; and 1 took 1 + compound and 1 cylinder. Of those needing a sphere for one eye, 6 were on the left, and 5 on the right.

In 8 cases of oblique myopic astigmatism 4 required — compound for both eyes; 3 took — compound and — sphere; 1 took — compound and — cylinder.

There were 4 cases of simple hyperopic astigmatism with oblique axes.

In 19 cases of mixed astigmatism with oblique axes 11 required compound for both eyes; 4 took 1 compound and 1 + sphere; 4 took 1 compound and 1 + cylinder.

In 133 cases of compound hyperopia axes 90 or 180, 92 required compound for both eyes; 34 took 1 compound and + sphere; 7 took 1 compound and 1 cylinder. Of those requiring spheres for one eye 18 needed it on the left and 16 on the right.

In 14 cases of compound myopia axes 90 or 180, 6 required compounds for both eyes; 6 used a — sphere in one eye; 2 used + sphere in one eye.

In 12 cases of simple hyperopic astigmatism 9 required cylinders for both eyes; 3 took + spheres in one eye.

In 18 cases of mixed astigmatism axes 90 or 180, 10 required compounds for both eyes; 5 took 1 compound and 1 + sphere; 2 took 1 compound and 1 + cylinder; 1 took 1 compound and 1 — cylinder.

Of the 428 cases, 20 were boys under sixteen years; 82 were girls under twenty; 155 were women; 171 were men.

QUADRALITY OF A TRUE WOMAN.

She must be attractive enough so she will maintain her equality with others, and know it. She will not then be jealous.

She must be discreet and avoid gossip, particularly that of traducing her own sex.

She must know how to live within her income whatever that may be.

She should know how to cook and do housework. No general is competent to command until she knows how to do things herself.

DUALITIES OF HUMAN ILLS.

Mental—Real and imaginary.

Real—Insanity and idiosyncrasies.

Insanity—Violent and melancholy.

Idiosyncrasies—Harmless vagaries and dangerous tendencies.

Imaginary—Original and grafted.

Original—Demonstrative and secretive.

Grafted—Pride and fear.

Physical—Congenital and Acquired.

Congenital—Nerve deficiency and organic deformity.

Nerve deficiency—Parental ignorance and misfortune.

Organic deformity—Eyes and other functions.

Acquired—Malnutrition and habits.

Malnutrition—Lack of quality and improper quantity.

Habits—Neglect and excesses.

CAUSES OF HUMAN ILLS.

1. **Congenital—Conditions previous to birth.**
2. **Infection—May occur at birth or after.**
3. **Malnutrition—Lack of proper food.**
4. **Physical Shock—Accidents, etc.**
5. **Mental Shock—Fright, grief, etc.**
6. **Physiological strain—Hyperopia, overeating, etc.**
7. **Mental Strain—Worry, study, etc.**
8. **Habits—Excesses, etc.**
9. **Occupation—Hazardous, etc.**
10. **Atmospherical Influences—General climatic or sudden changes.**

NERVOUS DUALITIES.**STRUCTURAL—**

Cerebrum and Cerebellum.
Pons Varolii and Medulla Oblongata.
Cerebro-Spinal and Sympathetic.
White, fibrous matter and Gray, vesicular matter.
Ganglia, or centers and Plexuses, peripheral network.
Dura Mater and Pia Mater.
Lobes and Fissures.
Ventricles and Commissures.
Convolutions and Peduncles.
Nerve Substance and Nerve Force.

FUNCTIONAL—

Mental and Physical.
Sensation and Motion.
Chemical and Mechanical.
Voluntary and Involuntary.
Afference and Efference.
Heat and Special Sense.
Organic Motion and Locomotion.
Cranial and Spinal.
Intrinsic and Extrinsic.
Supply and Demand.

PATHOLOGICAL—

Shock and Strain.
Irritation and Exhaustion.
Spasm and Collapse.
Paralysis and Atrophy.

THERAPEUTICAL—

Rest and Nourishment.

CONSTANTS AND INCONSTANTS

A Few Hints for Students Who Want to Get to the Bottom of Things the Easiest Way.

Topical study is the best because it yields the surest returns. If everyone will seek the simplest forms of everything, comprehension will be easier and study will be made more attractive. In the following paragraphs, which refer to matters contained in this book, constants are named first because they belong to the positive class, while the inconstants which follow constitute the negative class:

Thought and expression.
 Laws and rules.
 Language and ability to use it.
 Knowledge and belief.
 Physics and metaphysics.
 Truth and falsehood.
 Reason and prejudice.
 Analysis and diagnosis.
 Anatomy and physiology.
 Nerves and nerve-force.
 Indices of refraction and angles of incidence.
 Plane and curved surfaces.
 Parallelism and divergence or convergence.
 Verticals and perpendiculars.
 Horizontals and obliques.
 Refraction by lenses and amount thereof.
 Reflection from lenses and amount thereof.
 Principal foci and conjugate foci.
 Centers and circumferences.
 Axes of cylinders and their positions.
 Static and dynamic refraction of eyes.
 Far and near points of eyes.
 Errors of refraction and corrections often given.
 Principal and secondary meridians of compound or cylinder lenses.
 Food and nutrition.
 Capacity of lungs and volume of air breathed.
 Capacity of heart and quantity of blood.
 Capacity of stomach and manner of utilizing.
 Capacity of doctor and confidence of patients.

Air is composed of 79.19 parts nitrogen to 20.81 parts oxygen. Learn how to breathe; take in plenty of it and throw out the carbonic acid gas. You will never die from consumption.

Opportunity never tarries long with him who says "I can't."

REASON AND "TAINTED" MONEY.

There's a Great Day Coming When Grafters Will Cease to Graft.

"Resolved, That the officers of this society should neither solicit nor invite donations to its funds from persons whose gains are generally believed to have been made by methods morally reprehensible and socially injurious."

This resolution was offered by Rev. Washington Gladden at a meeting of the American Board of Foreign Missions in Seattle, Wash., during September, 1905, and it was killed by a vote of 46 to 10. In support of the resolution Dr. Gladden declared:

"If money cannot be tainted, then it cannot be sanctified. I hope we are not yet ready to say that there can be no such thing as consecrated money."

Now, therefore, that the board, by its action, has declared there is no such a thing as "tainted" money Dr. Gladden is honor bound to come out with a counter-declaration that "consecrated" money is also moonshine.

Reason tells us that whenever a church work is conducted as a business it must have its share of the coin of the realm. Experience has taught that "beggars cannot be choosers," therefore the board did a wise thing in voting down a resolution which might have hampered it in its chase of the millionaires.

Dr. Gladden said: "The gifts of the Congregational churches to missions are less now than they were ten years ago, although their numbers have increased considerably and their wealth has probably doubled." Reason tells us that this is because the members are growing wiser and learning that money does not draw interest in heaven. In other words, they are getting onto the graft. Barring accident I expect to live to see the day when people will live about right from a comprehensive knowledge of the fact that they pay the penalties for violations of Nature's laws right here, instead of hereafter, and when that time comes fanatics will be out of a job.

THE INHERENT RIGHT TO THINK

A Bitter Conflict Coming Between Reason and Superstition.

The old schools of alleged medicine have no greater fight to maintain their positions than have the old schools of alleged thought. As the first named works under a cloak of pretended benevolence, so the latter acts on the pretense of inspiration from a source not accessible to mortals whose keepers they assume to be. Both will fail as surely as there is an infinite power that plays no favorites, and here is the manner in which their failure will eventuate.

One class, headed by such Christians as the Standard Oil king and eminent executives who have referred to Thomas Paine as "a nasty little atheist," just now dominates thought, insolently assuming that all who

differ from them on the money question are dishonest and all who judge the prevailing alleged moral code by its fruits are fit only for dungeons. This class is just now using all the machinery of the government to suppress free thought, free speech and free press.

Another class, so numerous that it can, if it will, before its franchise is taken from it, reverse the present order and abolish the inquisitorial system by throwing its entire vote, national, state, county and municipal, to whichever of the great parties will insert a free thought, etc., plank in its platform and nominate candidates for office who will pledge themselves unqualifiedly to the proposition. It is of no use to form independent parties. The socialists and all small parties are headed by dangerous cranks. But let us, who regard the right to think a more important item of political economy than money, unite in a pledge to defeat any party, which, being in power, grants special privileges to its own votaries and denies other citizens their constitutional rights.

These alleged Christians, who interpret their "Master's" teachings to suit their own pleasure, are the rankest hypocrites the world has ever known. Their tactics are those of the coward, the bulldozer, the assassin, the libertine, the harlot, the gossip.

I call upon the thinking voter, the man of reasoning powers, unhampered by fear of anything, and supported by love of liberty to himself and his fellow men, to give this matter his immediate attention, and remember it is the duality words and works that will win. Let the narrow-minded, superstitious scoundrels know they will lose their official positions if they do not concede justice to all and they will soon lose their "convictions" rather than lose their jobs; all of which will prove conclusively their present insincerity.

It is a weak cause that shrinks before the fire of criticism.

If you do not want to owe others, do not let others owe you.

Freshness is not smartness, because the smart are never fresh.

Seek natural immunity from disease and other than artificial cures.

Some people would rather remain ill than get well by rational means.

The friend who makes a joke of your profession is worse than an enemy.

Some things are too cheap to be good; others are too good to ever become cheap.

When one has had his appendix removed, how can he have "recurrent appendicitis"?

The busy bee finds its pleasure in work. The lazy drone finds it in eating the honey.

Experience is often an expensive teacher; but teachers sometimes cause expensive experiences.

Trying to secure an education by correspondence is like spending the evening with one's sweetheart's picture.

CLASSIFICATION OF CASES.

- | | | |
|--------------|---|---|
| + Cases. . . | { | + Dynamic and + Static Symptoms. (1).
+ Dynamic and — Static Symptoms. (2).
— Dynamic and + Static Symptoms. (3). |
| — Cases. . . | { | + Dynamic and — Static Symptoms. (4).
— Dynamic and + Static Symptoms. (5).
— Dynamic and — Static Symptoms. (6). |

By dynamic tests we mean any subjective method which, when applied, induces nervous activity, either voluntary or involuntary. The accommodation test is a voluntary dynamic test of the nerve supply; the refraction test, when made as we make it, without the use of cycloplegics, is a dynamic test of the involuntary kind.

By static tests we mean what is known commonly as the muscle test, and the use of the neurometer. Should these dispute the dynamic tests, we give credence to them because they are involuntary.

Symptoms are noted both objectively and subjectively and are mental and physical. The value of this system will be appreciated when the student learns how to determine just what proportion of causes and effects are mental and physiological.

Note the diagram shows eight divisions or classes of patients; two grand divisions and three subdivisions of each. For the details of this proposition see the following six pages.

CLASSIFICATION OF CASES—Continued.

Sub-Division No. 1.

When derangements of the nervous system begin to exhibit symptoms the tendency is nearly always upward from the normal standard. We do not see a great many of this class because the public is a careless body and puts off consulting the doctor until the situation becomes serious enough to set up pain or fever, hence these two symptoms are regarded by the Neurologist as Nature's duality of automatic alarms, and the doctor who gives drugs to suppress either exhibit is proceeding in a manner conducive to greater troubles.

Tonic spasm of the nervous system may make its appearance in the eyes, causing intense pains; in the sphincter-ani, producing constipation, indigestion, piles, etc.; in the sphincter-uteri, making menstruation difficult and painful; in the neck of the bladder, interfering with complete emptying of that organ and necessitating frequent trials both day and night, reflexing on the kidneys and producing chemical reactions that give the impression of serious renal disorders. Such a general physiological disturbance naturally affects the mentality and the victim becomes irritable, which may exhibit in fright or temper.

We apply our systematic methods of analysis and find exactly the value of each symptom, objective and subjective, make our calculations deliberately, then take the diagram and show the patient the situation so comprehensively that we inspire confidence, which is one of the essentials to securing obedience to our instructions. If any are so dull or so unreasonable that they ask us to undertake a case without the patient's hearty co-operation we refuse. But with this class we do not need to be so strict as we must with those who exhibit a preponderance of negative symptoms.

CLASSIFICATION OF CASES—Continued.

Sub-Division No. 2.

This class has, naturally, many of the symptoms exhibited by No. 1, but the static tests will disclose evidence of progress by exposing weakness, such as the — impulse in the ocular nerves, occasional nausea while at work, skin devoid of moisture, and historic indications which have more or less weight in the final calculations. The + symptoms may include a strong accommodation, tonic or clonic spasm during the refraction test, indigestion, dysmenorrhoea, bladder trouble, insomnia, abnormal appetite, together with the mental symptoms of the first class.

In arriving at final conclusions about this class we make certain deductions from the age figures in the neurometer so that we may prove the accuracy of our valuation of the several symptoms by telling the age approximately.

This class, belonging to the second sub-division of the first general division, presents to the uninitiated a fairly good appearance, our dynamic tests show all + and we only find — symptoms with our static methods; hence it is easy to locate its subdivision after a little experience. My pupils get the experience while with me, so they have no difficulty when they go out into the field of practice. Indeed the only complaints I have ever received from them have been that it is hard to persuade their patients to follow instructions as they should to insure success. I have a letter from one of my boys who gave written guarantees to over 2,000 cases the first two years of his practice, in which he writes: "I have just received reports from them in reply to a personal letter from me asking for the favor. All are sound as they ought to be. In all this large number I only refunded their money to five, and they did not follow instructions even approximately. I practiced medicine several years—long enough to become disgusted with it—before I came to you. I also investigated, studied and practiced osteopathy and other methods, hence I feel qualified to speak; therefore I want to say that your methods of analysis and treatment are unequaled."

CLASSIFICATION OF CASES—Continued.

Sub-Division No. 3.

This class is hovering near the dividing-line between the + and — grand divisions. It is a trifle difficult for the beginner to differentiate between this and the next lower grade, because the symptoms are so nearly alike, but with the assistance of this page and the consciousness that if there is any doubt and the patient be treated as if it belonged to sub-division No. 4, the operator is working inside the safety line anyhow.

The same general symptoms of classes Nos. 1 and 2 will be present still, of course; the dynamic tests show weakness, but the static tests dispute the story, so we know the case belongs in the general + class and we will find other evidence of that fact when the final calculation is made.

The most delicate test that could be imagined is that by which we establish the safety-lines for each class of patients. It will be seen by reference to the neurometer, pages 82 to 91, that the age indicated by table one is the normal standard; the explanation accompanying shows that there are so few who are normal that a second standard is necessary to judge abnormal cases accurately, hence table two; from it we learn how much to add to the age for the defects in the gauges; then supplementary tables show how much and when to deduct for general and individual symptoms. The age indicated by the second table is the physical standard of average hyperopes in good health, and any who approximate it belong in the general + class, but we must take into consideration the mentality, the extra hours' work and the effects thereof. For example: A hyperope of 1.00 D. is also working three hours a day over the three allowed for in the neurometer; this means an extra demand on the nerve supply equal to .50 D. hyperopia, so we figure it in connection with the refractive error, making a basis of 1.50 hyperopia, for which table two says add seven years, six months to the showing by table one. Therefore this individual's standard would be two and one-half years below the average. If the age is actually below the figures thus evolved the patient is below his or her own standard and it is a — symptom. If the actual age is more than half way down to the showing by table one that patient is below the safety-line. Or, if one be not working extra hours, but is both intelligent and educated, particularly practical, we charge to the age account, by tables one and two, from five to ten years, owing to the relative intensity of the mentality, and thus get the standard for that person.

CLASSIFICATION OF CASES—Continued.

Sub-Division No. 4.

This class presents a general appearance somewhat similar to the last described, but to us there is a decidedly haggard expression, dark crescents under the eyes, face is rough and scaly, history of long-continued functional derangements. The dynamic tests show + but the static tests corroborate the history. This suggests that the patient has a strong mentality and will be able to take advantage of every little physical improvement we can produce; but if the person is uneducated the mentality may be able to grasp only enough of the explanation to become suspicious and contrary, hence the necessity of a hard-and-fast rule, in all cases, that they bind themselves to follow our instructions for three or four months, if we find it necessary, and put up the full fee in advance to protect us from injury to our reputation by their neglect.

This class of cases always presents analytical symptoms, particularly by the static tests, which make necessary deductions from the amount to be added according to table two, of the neurometer, which deductions, in themselves, are evidence the patient is below the individual standard; if, when we have made these deductions, the age is still lower, we have not placed as serious a value on the symptoms as they merit. Thus it will be seen that when our diagnoses are wrong the analyses will correct them just as the law analyzing compound prescriptions for glasses will prove them if they are correct and catch the errors if they are wrong.

All of our work is based on physical laws, and many of them will be found as accurate physiologically as they are physically, if the student will apply the study required to master their principles. Others will be such guides that they will come to be regarded invaluable.

CLASSIFICATION OF CASES—Continued.

Sub-Division No. 5.

This class is one in which the patient is usually alarmed, with sufficient cause, too. The matter has been neglected so long that the daily work, which is all dynamic, constantly causes distressing symptoms to present themselves. If the patient only knew it these manifestations are Nature calling on the custodian of that particular tenement to look after the matter of repairs.. The history is bad, the dynamic tests show weakness, but the static test shows zero and the neurometer shows the age exactly; if the history is one of dysmenorrhoea there will now be not only the pains but the menses will appear too often and there will be flooding; there may be constipation in these cases from sheer lack of nerve force to empty the bowels; the liver will be torpid and the brain dull or erratic, from the same direct cause. These cases are always below the safety-line, which is the normal standard before deducting for the — symptoms. This class, strange as it may appear, is nearly always from the ambitious, intellectual student body, or from those whose work is of such a nature that close application is necessary and who are in such financial condition that they “can not spare the time or the money to get well.” Rather a reflection on the intelligence, is it not?

In summing up these cases we find, say a defect of 1.00 D. in the eyes, for which we would add ten years to the neurometer figures, and ten more for the mentality. But we find, also, a habitual overloading of the stomach and wrong elements in the food, habits which add to the general strain when the system should be at rest; we find the tests require us to make great deductions from the showing by the tables, but they do not bring the total down below the amount added for the mentality, hence we know the chief cause is in the mental department and is simply neglect, willful or ignorant, of the laws of Nature, which cause is assisted by the physiological defects we find and correct.

CLASSIFICATION OF CASES--Continued.

Sub-Division No. 6.

This class adds to the last described actual collapse; some manage to get to the doctor's office but are unable to stand an examination without nausea or faintness. They may be either hysterical or melancholy. The latter are the most difficult to handle because they become either stubborn or irresponsible, and we prefer to treat only those who are able to do the real treatment themselves. Those who are so far beyond the limit-angle that they are mentally or physically helpless are not in our classes. Of course we can do as much for such cases as any "pathy" practitioner, but we would have to guess at them just as the others do.

The tests, dynamic and static, will be bad; the history bad; the appearance bad; and when the account is cast up according to the neurometer the patient will be found to be not only below the safety-line as indicated by the deductions being so great as to wipe out the additions for the mentality, but to reduce the remainder to a point more than half way from the hyperopic standard to the emmetropic standard. For an example take a person with 1.00 D. hyperopia who shows 7.00 D. accommodation with the correction on: the neurometer, table one, shows age thirty, to which would be added, normally, ten years for the hyperopia, making forty; then we would add some more for the mentality but for the abundance of negative symptoms and almost entire absence of positive indications in the general history; next, the deductions made necessary by the evidence secured by the tests, reduces the age figures to a point below thirty-five, and we pronounce the case below the danger-line if our calculation proves correct. If patient is really above thirty-five but is under forty our analysis shows a better situation than we diagnosed and we are correspondingly happy; however the case is below the safety-line and we insist upon rigid adherence to instructions. If any case, with all the symptoms and appearances of this class declares an age which puts it above the safety-line we suspect something wrong, either with our measurements or with the patient; it is often the latter, is usually a woman who is convinced she is going to die, go crazy, or some other equally absurd proposition. We satisfy ourselves of the situation by repeated examinations and when convinced of the facts, if they be mental, as described, read the riot act in no uncertain manner.

THE UNVALUE OF ENCYCLOPAEDIAS.

The Story of "Hystero-Epilepsy" as told by William Pepper in one of the Popular Editions.

Of all the hero-worshippers in the history of the world none have equaled the medical profession. The leaders of today pay exclusive honors to the dead lest they give a colleague a slight advantage over themselves; or else it is vanity expressed in seeking to connect themselves with those whom they conceive great. The following account of "hystero-epilepsy," written by the late William Pepper for Johnson's Encyclopaedia is a fair sample of the nonsense called fact by alleged authorities:

"Hystero-epilepsy. A form of hysteria in which the manifestations are of a convulsive nature and therefore resemble the attacks of epilepsy. The causes and nature of this diseased state are in no wise different from those present in other forms of hysteria; and the fact that such violent seizures take place can only be explained by assuming that the motor cells of the brain are in a highly charged or excitable condition and easily disturbed, whereas in other individuals such a state does not maintain. It is to Prof. Charcot, of Paris, that the world owes the accurate description of this disease, and, what is of greatest importance, the ability to distinguish it from the serious and generally incurable disease which it simulates—viz., true epilepsy."

The trouble with these fellows is they are always reminding the world of the debt it owes the mountebanks. They forget they owe the world something for being allowed to live in it. I have been able to prove that there is no such thing as epilepsy, in the sense it is described above; that the "simulated" epilepsy, mentioned as a form of hysteria, is due to suppressed menstruation in girls and that the primary cause is always hyperopia; while in boys it is from hyperopia and overeating. But the world owes me nothing in particular that I can see. I will give the rest of Dr. Pepper's article to show what a fool a man can make of himself when he gives way to "hysteria."

"Like the latter, hystero-epilepsy is a paroxysmal disease, the seizures occurring with greater or less frequency, according to the mental and physical condition of the patient and according to the environments.

"Very generally the patient has a premonition, taking the form of a peculiar sensation in the abdomen or elsewhere, and this is usually sufficiently in advance of the paroxysm that the patient may place herself in a safe position. In falling the subject of hystero-epilepsy is rarely injured, as so frequently occurs in true epilepsy. There may be at the moment of seizure a sharp, piercing cry, an hysterical cry, after which the patient becomes convulsed. At first the limbs are rigidly contracted, but this soon gives place to irregular contractions" (it surprises me that they would have anything to do with diseases manifesting 'irregular' symptoms), "with frothing at the mouth and apparently or really loss of consciousness. A peculiar feature of the whole attack is its dramatic quality. Charcot particularly called attention to the position assumed by many—that of a cross, both arms being extended outward, the body and legs being rigid and straight. The contractions and the tossing of the body dur-

ing the latter part of the attack may be violent, but it is noticeable that the patient rarely is injured. Consciousness is apparently lost, but very often a threat will instantly break up the attack, showing that in reality the patient remains conscious throughout. In other individuals there is genuine unconsciousness.

"During the attack, especially in the last part of it, the patient becomes talkative or noisy. Often she sings or declaims and generally the words are accompanied by gestures, and indeed this apparently purposive action, or as was said before, this dramatic element, is generally noted throughout the attack. After various lengths of time the patient recovers and may fall into a quiet sleep, or may be tranquil and awake. In some instances temporary palsy of a limb or of one side of the body may follow, or, indeed, this may persist for years. Contractures of the muscles of the hand or foot and alterations of sensation are also frequent sequels and are distinguished by their general hysterical features.

"The work of Charcot which lead to the accurate distinction of hystero-epilepsy from true epilepsy is one of the great achievements of this distinguished teacher. Hystero-epilepsy is eminently benign and manageable in comparison with genuine epilepsy, and its treatment is essentially different. The principal points of distinction are these: the disease occurs more frequently in girls and especially those of a distinctly hysterical nature; the attacks are usually ushered in with a cry; is not often attended by danger of injury; is noisy, dramatic and not accompanied by the extreme unconsciousness of true epilepsy; urine is not voided during the seizure. Sometimes a dash of cold water, or pressure on the superorbital nerve will instantly terminate the paroxysm; and by suggestion other parts of the body may be made to assume the same role.

"The treatment must be conducted as in hysteria of other types by moral training, physical development and by control. Magnets and plates of metal have been found to stop the seizures when applied to the parts involved in the attacks. Manifestly suggestion is the important factor in this treatment. Harsh measures may succeed in breaking up the paroxysms, but will probably substitute some less apparent form of hysteria, and rarely accomplish anything but harm."

The foregoing may be taken seriously by the doctor trained to reverence the self-styled leaders of the profession but it will only tickle the funny-bones of my pupils, who have been urged to think for themselves and to analyze all statements, no matter whence they may come. If I had written the manuscript for this book in the same long-drawn-out style Dr. Pepper used in telling that incoherent story it would comprise ten thousand pages, and would, probably, have been as incoherent; however, I would not have split my infinitives so badly, I am sure. As to Charcot, he may have described the finicky conduct of some French woman, but when he undertook to separate the manifestations of what he pleased to call "hystero-epilepsy" and "true epilepsy" he made himself ridiculous. As a matter of fact, pure and simple, there can be no accurate description of the symptoms of the same causes in different people, differently constituted to begin with, and whoever undertakes it is not wise. Of course there are some general indications, such as irritation or exhaustion of the nerve

supply, but persons congenitally weak, or those lacking in nutrition, or those with greater demands on the supply than others will exhibit more acute symptoms than those with even more serious causes. We neurologists pay little attention to single symptoms, because they are only diagnostic, but when we have made our analyses we know absolutely the value of each and of them all as a unit.

SOME BLOODY HISTORY.

How Alleged Christianity and Medicine Have Flourished at the Expense of General Public Welfare.

While Jesus Christ is reported to have said he came not to bring peace but a sword, etc., his example was so at variance with the story I do not believe it. It is true, nevertheless, that the sword is still with us, and metaphorically, at least, dangles over the heads of us who dare to think and express ourselves with reference to the pretenses and practices of the hypocrites who set themselves up as the conservators of the human race, in the name of God and Christ.

Six hundred years before Christ, Pythagoras, a Greek philosopher, was born. His fame rests chiefly upon the fact that he was the first to teach that mathematics is the first law of Nature, embodying the principles of all things, and that the organization of the universe is a perfect system of numerical ratios. His chief duality was deliberate thought and fearless expression. But his ideas and words threatened the supremacy of those who ruled through superstitions and fears and promises of rewards hereafter, and it was made necessary for him to go into retirement to escape violence, and he died soon after. He was the author of the word "philosophy," which means "the love of wisdom."

About the same time there lived, in another part of the world, a philosopher named Confucius, who sought, by his example, to accomplish what two other philosophers, Yao and Shun had about eighteen hundred years before that time, viz., blotted evil, poverty and ignorance from the Chinese empire by the virtues of their own conduct. Later, when the throne fell into the control of another class, the people became inoculated with different ideas and drifted back to the old conditions which Confucius found and endeavored to overcome. When about fifty years old he was appointed magistrate of the town of Chung-tu when he at once put his ideas into practice with such good results that he was promoted from time to time, each step widening his opportunities and the beneficent results. But his opponents, who thrived best under old conditions, fought him upon every pretext without avail until they seized upon his remark "respect the gods, but have as little to do with them as possible" and succeeded in arousing a sentiment against him as a heretic that made it impossible for him to retain his office with dignity, so he resigned and passed the remainder of

his life in the pursuit of knowledge and in dispensing information to those who sought it. He worked by the duality system; his five cardinal virtues being expressed as the duties of ruler and subject, parent and child, husband and wife, brother and brother, friend and friend. His was a practical philosophy, not a religion; he has as many followers today as Jesus Christ and much more faithful ones. Christians call the Chinese heathen, meaning ignorant, barbaric, etc., when they gave us mathematics hundreds of years before Jesus Christ was born. Christianity is great in precept (possibly) but Confucianism is great in practice.

About four hundred and seventy years before Christ, there was born in Greece a philosopher, Socrates. He arrayed himself, early in life, against the gnostics and sophists (know-alls) of his time and after a vigorous war for the love of wisdom as against those who claimed to possess all wisdom (just as the priests and doctors of the old schools do today) he was condemned to die at the age of seventy years, for the crime of not worshipping the gods his enemies worshiped and for corrupting the youth by teaching them to be ambitious in the pursuit of knowledge. (Yet the Christians tell us the world would have been in a bad fix without Christianity.) Being given his choice of means of execution according to the law, he chose hemlock tea and died as fearlessly as he had lived, proclaiming with his last breath his opinion that there is something for each individual to do in another existence. Aristotle credits him with being the author or inventor of induction and the accurate definition of terms.

At the same time there lived a clown, of the name Aristophanes, who was a religious aristocrat, opposed to democracy, progress, freedom of thought and expression. He was one of the chief persecutors of Socrates and his name has come down to us by the same token that of Booth comes with Lincoln. He was a poet and a cheap wit, skilled in the art of ridicule, but that was all. He has many disciples on the daily press of this day, who are working even more harm than he did because they have greater opportunity. But as there is not a line in history to his credit in the matter of uplifting humanity, so there will never be in theirs. He and they were and are as arrogant, selfish bulldozers as any gold-bug of 1896, breed of politicians. Nearly all of them are Christians, too.

Aristotle, another Greek philosopher, born 384 B. C., was a second Socrates, and after the death of his friend King Alexander, to whose son he was tutor, he was accused of impiety and had to flee the country to save his life, or, as he put it: "to save Athens the opportunity to sin against philosophy a second time." Aristotle coined the word metaphysics as referring to mind study because the prefix "meta" means "after" and he argued we should first study physical laws, or the products of an infinite mentality, then study that mentality.

Jesus Christ was born about five years before the present system of numbering years was adopted. He created the greatest furor of all by

making absolutely no pretenses as a philosopher. He announced that he was the son of God and the future judge of the world. He declared boldly that the dominant religions were humbugs and urged people to judge them by their works. He gathered about him a lot of fishermen and others, the poorest elements, instead of philosophers; they aggregated several hundreds; from these he selected twelve apostles to attend him and learn his methods. He was a young man of great magnetism, evidently; then his mysterious proposition appealed more strongly to them than did the mathematics of the philosophers and he succeeded in organizing the masses so well that he left an impression on the history of Europe and parts of Asia and Africa since he lived. His conduct was more revolutionary than any of his predecessors, the philosophers, and he was soon regarded as more dangerous. That settled the matter; he was promptly sentenced and executed by order of the existing religions when he was about thirty-six years old.

Peter was Christ's first apostle and it was from him that the scheme of organization was acquired, doubtless, which enabled Peter to become bishop of Rome and the first of all the popes, of which there have been two hundred and sixty-one up to the time of going to press. Under the reign of the Roman Catholic church and its offshoots, the protestants, there have been all kinds of deviltry from drawing and quartering to burning at the stake. This part of Christianity still hangs on in spirit when such men as the president of the United States refer to the late philosopher, who wrote "The Age of Reason" as "A nasty little atheist," when, in that wonderful book Thomas Paine declared "I believe in one God and no more." A Christianity that makes a man intolerant is strictly in accord with the history of the church, but not in accord with the example of Christ's life.

Priscillian, bishop of Avila, Spain, was the first heretic. He founded a sect of his own which became so powerful that, although he was tried, convicted and executed by order of the Council of Treves, under Pope Siricius, the organization was not broken entirely for nearly three hundred years.

During the period from the twelfth to the sixteenth century the conduct of the priests became so outrageous that honest men could not keep silent and heretics became plentiful. Then it was that the inquisition began active operations and smeared history with blood. The edict went forth that in all parishes one priest and three laymen should devote their whole time to hunting for heretics and when any were found their property was to be destroyed or confiscated, and even those under suspicion were to be denied medical attention. Of course this afforded opportunity for persecution and the first politics of the modern stripe began to be practiced. The results of the campaign were not such as were expected, instead of suppressing thought it set the most ignorant to thinking. The inquisitors advertised their own criminality; the people saw; their eyes were opened

and in rapid succession new creeds were promulgated which, while supporting what was regarded as legitimate in the old church, protested against the inquisitorial body and its methods, hence they are called protestants to this day. They are only a shade better, if any, than the old Roman Catholic church, in the matter of intolerance.

Some of the dissenters were more noble than others; for example, Savonarola, who did not seek to establish a new church and thus secure honors to himself. He opposed vigorously the debauchery of the priests and fought for purity in the Catholic church; he was not a heretic in any sense of the word; but the majority was against him and he was put to death for his labors. He will be remembered long after the popes are forgotten.

Martin Luther was a later priest who opposed the gang. He made his first rabid onslaught when he found some of his parishioners, in a new field to which he had been assigned, had been in the habit of purchasing advance indulgences for contemplated crimes. Investigation showed it was a great and general source of revenue. He denounced it, and while the pope may not have favored the practice, he hated Luther for exposing the crimes. In the controversy that followed the dissenter was supported by the German throne, and when it was proposed to take him to Rome for trial he refused because he knew it was like a Chicago justice shop down there. Then the pope issued a bull against him, deposing him from the priesthood; but Martin, not a whit abashed, burned the bull, tail and all, and started up a little church of his own which is holding together today.

John Calvin, a heretic himself, and author of the Presbyterian church, wrote a book, after he escaped to Geneva, in which he defended the right of the church to put heretics to death. He probably figured that he would have to do a little killing himself to make the Presbyterian church a winner.

Wars grew out of these inquisitions and secessions until the civil governments had to take a hand to stop them and restore inter-state commerce, and, finally, in 1648 the peace of Westphalia was accomplished by the terms of which the creeds of the Roman Catholic, the Lutheran, and the Reformed churches were declared, in all civil respects, to be non-heretical. Of course the pope, true to tradition, issued a bull declaring the agreement without effect and the troubles have continued to the present moment; but the pope's claws were trimmed and the other fellows were muzzled to a considerable extent. Of course, even in this country within the last two hundred years the Christians have burned dissenters at the stake, alleging them to be witches, but they found that for every witch or wizard burned twenty were born and they changed their tactics to vaccination laws and medical practice acts, which are most virulent in Massachusetts, where the witches were burned. Of course the western and southern people, Christians too, burn or torture a negro degenerate once in a while, which philosophers would not do, but it is not to be

wondered at in view of the history of Christianity, in which everything was done by force.

As philosophy finds its way to the hearts of the people generally all sorts of persecution will cease. Each man and woman will endeavor to become better acquainted with the Infinite laws that guide all things in a simple manner, and they will make that acquaintance, not through the mediums of priests and prayers but by studying the daily manifestations of those laws and finding the reasons for them in their effects.

The most impudent thing I can conceive is prayer to the author of the universe to alter those laws to suit the vagaries of the finite mind, hence I do not waste time praying, and I never will.

IMPORTANT.

My time is occupied so completely that I cannot undertake to reply to letters of inquiry (except from graduates of my school) unless I receive some remuneration therefor. Hence, others who desire consultation will inclose draft or money order for \$10, together with replies to the following questions:

From the doctors I want the general appearance, history of case, ophthalmoscopic appearance, diet, habits, vision, L. and R., dynamic and static tests before and after correction of eyes, the prescription for eye glasses and age of patient.

From the patient I want answers to the following:

-
- | | |
|--|--|
| 1. Nature of complaint. | 26. Are you like father or mother? |
| 2. What is the effect? | 27. What is your occupation? |
| 3. How long running? | 28. What is your rising hour? |
| 4. Your opinion of cause. | 29. What is your bed time? |
| 5. What has been done? | 30. Have you ever been operated upon? |
| 6. Who did it? | 31. Can you see equally well with each eye? |
| 7. What did it cost? | 32. Try both eyes together on news print, read as close as you can by straining long enough to read two lines and give distance in inches. |
| 8. What benefits resulted? | 33. Have you worn glasses, if so was it constantly or for near work only? |
| 9. What do you eat? | 34. Who prescribed them? |
| 10. What is your poorest meal? | 35. If a female, are your menses regular? |
| 11. What the best? | 36. Are they painful? |
| 12. Is appetite ever ravenous? | 37. Are they copious or scant? |
| 13. How is digestion? | 38. Are you well developed or flat-chested? |
| 14. Are bowels evacuated daily? | 39. Have you children? |
| 15. How often do you take medicine? | 40. How many? |
| 16. What do you take? | 41. Are all living? |
| 17. What for? | 42. If any dead, give particulars. |
| 18. Do you eat much salt? | 43. Were you well during pregnancy? |
| 19. Do you eat fruit, if so when? | 44. Had any miscarriages, if so, what cause? |
| 20. Do you eat much pastry? | |
| 21. How about potatoes and other vegetables? | |
| 22. Do you have gas on the stomach? | |
| 23. Are you fat or lean? | |
| 24. Give height and weight. | |
| 25. What is your complexion? | |
-

Talking about the stream of time: those who do things, row up it instead of floating down. That is why the rowers and floaters get so far apart.

CONDENSED FEE TABLE.

Instead of charging patients a fixed fee per visit and letting them come as they please, neurologists charge a lump sum for the case and regulate the visits as analysis demands.

Eye examinations, \$10.

General examinations, \$25.

I use names according to old-school because they will know what is meant. We only recognize symptoms.

Abscesses, from \$50 to \$100.

Acidity, same.

Albumenuria, \$100 to \$250.

Amenorrhoea, same.

Anaemia, same.

Angina Pectoris, same.

Aphthae, \$25.

Apoplexy, \$100 to \$250.

Asthma, same.

Appendicitis, same.

Atrophy, \$25.

Biliousness, \$50 to \$200.

Bladder Troubles, \$100 to \$250.

Bronchitis, \$25 to \$100.

Calculi, \$100 to \$500.

Catarrh, \$50 to \$250.

Chlorosis, \$100 to \$400.

Chorea, same.

Conjunctivitis, \$25 to \$100.

Constipation, see biliousness.

Consumption, \$100 to \$1,000.

Debility, \$100 to \$500.

Diabetes, \$100 to \$250.

Diarrhoea, \$10 to \$25.

Dysmenorrhoea, \$100 to \$250.

Dyspepsia, \$200 to \$500.

Eczema, \$50 to \$250.

Epilepsy, \$100 to \$400.

Emissions, \$50 to \$100.

Enuresis, \$100 to \$400.

Floating Kidney, \$100 to \$500.

Flatulence, see acidity.

Gall-stones, see calculi.

Gastralgia, see acidity.

Gout, \$100 to \$500.

Hemorrhoids, \$100 to \$250.

Hypochondria, \$200 to \$1,000.

Hysteria, same.

Impotence, same.

Leucorrhoea, \$100 to \$250.

Lumbago, \$50 to \$200.

Neuralgia, \$100 to \$500.

Nymphomania, same.

Obesity, \$50 to \$500.

Prolapsus Uteri, \$100 to \$500.

Prostatitis, \$100 to \$500.

Rheumatism, same.

One reason some good-intentioned people fail to do good is that they carry their fads too far, thus making them ridiculous. The person who is fool enough to believe in vaccination in the face of the damage it has done, has a perfect right to do so; that person can vaccinate himself all he pleases without protest on my part; but when he wants to force me to take the dose he becomes a criminal.

GLOSSARY

- Aberration**—Departure from normal.
- Absorption**—To take up.
- Acetabulum**—The cavity that receives the thigh bone.
- Achromatic**—Without color.
- Achromatopsia**—Total color-blindness.
- Albinism**—Absence of the layer of pigmentum nigrum in optic choroid.
- Anaemia**—A condition of wasting.
- Anchyloblepharon**—A stiffening of the eyelids.
- Aneurism**—A wart-like dilatation of vessels.
- Anisometropia**—Unequal vision in one's two eyes.
- Anopsia**—Without vision.
- Amaurosis**—Obscure vision.
- Amblyopia**—See Amaurosis.
- Ametropia**—Imperfect refractive condition of the eye.
- Aphakia**—Absence of crystalline lens.
- Aplanatic**—Corrected rectilinearly.
- Apparent**—Something seen.
- Approximate**—Nearly.
- Arcus Senilis**—Senile ulcer, degeneration of corneal cells forming gray crescent or circle at edge of cornea, mostly in old people; harmless.
- Astigmatism**—Without a point. Caused by irregularity of the curvature of the refracting media.
- Asthenopia**—Fatigue of ocular nerves, neurasthenia.
- Atrophy**—Loss of vitality, wasting.
- Biliary**—Referring to the liver.
- Binocular**—Two-fold vision. To see with both eyes at once.
- Blepharitis**—Inflammation of the eyelids.
- Bulimia**—Morbid hunger. Occurs after eating too much; is, in fact, nature calling for help to digest what is in the stomach.
- Canthi (s, canthus)**—Angles formed by the upper and lower eyelids, from the middle to either side.
- Combination**—A union of parts.
- Centripetal**—Tending toward a center.
- Centrifugal**—Tending from a center.
- Convergent**—Two or more lines inclined toward a point.
- Chromatic**—Pertaining to colors.
- Conjugate**—Yoked together.
- Cylindrical**—Like a cylinder.
- Catoptrics**—Laws of reflection of light.
- Chalazion**—Tumor of the eyelid.
- Chromatopsia**—Abnormal color sense.
- Cilia**—The eyelashes.
- Ciliary Body**—Apparatus of accommodation.
- Collyrium**—An eye-wash.
- Coloboma**—A mutilation.
- Conjunctiva**—To join together. The transparent membrane which lines the lids and covers the front of the eyeball.
- Conjunctivitis**—Inflammation of conjunctiva.
- Cerectopia**—Pupil out of place.
- Coredialysis**—A rupture of the iris.
- Cornea**—Horny—The projection on the front of the globe.
- Cyclitis**—Inflammation of the ciliary body.
- Cycloplegia**—Paralysis of the ciliary muscles.
- Cycloplegics**—Drugs which paralyze the accommodation.

- Disintegration**—Separating parts.
Divergent—Two or more lines radiating from a point.
Dispersion—To scatter.
Density—Compact.
Diaphanous—Transparent.
Duality—Double.
Dacro-cystitis—Inflammation of the lachrymal sac.
Daltonism—Color-blindness.
Diopetre—To see through; a unit of measure in optics; one metre.
Diplopia—Double vision.
Dynamic—Force.
Ecchymosis—Black eye.
Ectopia—Partial luxation of the crystal-line.
Ectropion—Eversion of eyelids.
Emmetropia—A perfect condition of the refracting media.
Embolism—A rupture.
Entropion—Inversion of eyelids.
Entozoa—A worm-like parasite, which finds its way into almost any portion of the eye, and destroys tissue by causing small cysts.
Enucleate—To remove.
Epiphora—Overflow of tears.
Esophoria—Convergence of visual axes.
Essential—Necessary.
Equivalent—Equal in value.
Exophoria—Divergence of visual axes.
Exophthalmos—Abnormal prominence of eyeballs. Graves' disease.
Foramen—A passage or opening.
Fossa—A ditch.
Fundus—Bottom.
Finite—Having a limit.
Formula—A form.
Glaucoma—Green; a disease of the ciliary processes and optic nerve.
Glioma—Glue.
Hypothesis—A supposition assumed for the purpose of presenting an argument.
Horizontal—From horizon to horizon.
Hemopia—Half vision.
Hemeralopia—Day blindness.
Heterophoria—An abnormal muscular condition.
Heterophthalmos—Congenital differences of color in the iris, or of two eyes.
Hippus—Alternate contraction and expansion of pupil.
Hordeolus—A sty.
Horo-pter—The field of vision included by both eyes at once, without moving.
Hyaloid—Glass-like; a thin membrane which lines the inner surface of the eye.
Hyalitis—Inflammation of the vitreous.
Hyperphoria—One optical axis tends above the other.
Hypopyon—An abscess from corneal ulcers.
Inverted—Upside down.
Index—A pointer.
Iridectomy—A cutting of the iris.
Iridodialysis—Separation of iris from ciliary body, as a result of blows.
Iridodonesis—Trembling of the iris.
Iris (a rainbow)—The colored portion of the eye surrounding the pupil.
Iritis—Inflammation of the iris.
Jugular—Pertaining to the throat.
Jurisprudence—Relating to law.
Keratitis—Inflammation of the cornea.
Keratokonius—Conical shape of the cornea.
Keratonixis—Puncture of the cornea.
Luminous—Emitting light.
Leucoma—White.
Leucorrhoea—White, to flow.
Lagophthalmos—Inability to close the eyelids.
Locomotor Ataxia—Creeping paralysis.
Metaphysics—Pertaining to the mind.
Meridian—A line drawn from one side of a circle to the other through the center.
Meter—Measure.
Macula—Spot. The field of sharpest vision.
Malingerer—One who falsely pretends to have an incurable defect of vision, or other function, to excite sympathy or evade duty.
Metamorphopsia—Distorted vision.
Migraime—Sick headache.
Muscae Volitantes—Floating specks in the eye.
Mydriatics—Drugs which dilate the pupils.
Myopia—To close the eye.
Myotics—Drugs which stimulate the accommodation.
Neurology—The science which treats of the nervous system.

- Negative—Opposed to positive.
 Nodal Point—A center of curvature.
 Nebula—A cloud.
 Nephritis—Inflammation of kidneys.
 Neuritis—Inflammation of the optic nerve.
 Nictitation—To wink.
 Nystagmus—A jerking of the eyeballs.
 Nyctalopia—Night blindness.
 Oblique—Slanting.
 Oedema—An exudation.
 Ophthalmia—Inflammation of the eyes.
 Ora Serrata—Serrated boundary. The circle of connection between the retina and ciliary processes.
 Orthophoria—Normal muscular condition.
 Ophthalmoplegia (interna and externa)—Paralysis of the sphincter muscles of pupils and ciliary; usually from the use of cycloplegics.
 Parallel—Two lines constantly at equal distance from each other.
 Perpendicular—At right angles to.
 Positive—Absolute, direct.
 Physics—Natural philosophy.
 Plano—Flat.
 Palpebrae—The eyelids.
 Pannus—Corneal vascularization from long continued irritation.
 Pupil—A nipple. The optic disk.
 Phakitis—Inflammation of the lens.
 Phlyctenule—A pimple.
 Photophobia—Aversion to light.
 Pinguecula—A small elevation on the ocular conjunctiva; sometimes mistaken for pterygium.
 Posterior Synechia—Adhesion of iris to lens.
 Presbyopia—Old sight.
 Pterygium—A little wing. Is a hypertrophy of the conjunctiva and grows on sclerotic and cornea, sometimes interfering with vision. May be removed.
 Ptosis—A falling of the upper lid from paralysis of the third nerve.
 Retina—A net. The visual membrane of the eye.
 Repulsion—To drive away.
 Refraction—To break.
 Reflection—To turn back.
 Right Angle—Perpendicular.
 Respective—With reference to.
 Reversed—Turned around.
 Spectral—Refers to colors found by separation of a ray of light into its elementary colors by a prism.
 Symbol—Having resemblance.
 Spherical—Like a sphere or globe.
 Segment—A slice.
 Sclerosis—Hardening.
 Sclerotic—Hard. The white of the eye.
 Scotoma—Obstruction of vision from hemorrhages. Darkness.
 Staphyloma—A bulging projection. Anterior, comes after corneal ulcers, and is a bluish-white in appearance. Posterior, is a projecting backward of the posterior pole of the eye.
 Strabismus—To squint.
 Stroma—Bedding.
 Supercilium—The eyebrows.
 Symblepharon—Adhesion of ocular and palpebral conjunctiva, caused by escharotics, such as lime, ashes or other alkalis.
 Synechia—To hold together.
 Synchysis—To flow together.
 Transparent—Passes light so objects can be seen.
 Translucent—Passes light, but objects cannot be seen.
 Tapetum—A carpet.
 Tension—The condition of an organ, muscle or nerve when under strain.
 Thrombosis—A plugging of retinal vessels by blood clots. Sometimes causes hemorrhages which bring at least temporary blindness.
 Trachoma—(Rough.) Granular conjunctivitis.
 Trauma—A wound.
 Tinea Tarsi—Eczema of border of lids.
 Urea—The chief solid constituent of urine.
 Uveal Tract—The choroid, iris and ciliary body of the eye.
 Vertical—Straight up and down.
 Virtual—Existing in effect.
 Vesicular—Bladder-like.
 Vascular—Pertaining to vessels.
 Vitreous—Glass-like.
 Xanthelasma—Yellow patches of fibrous tissue on the lids, mostly of women. Harmless, but may be removed.
 Xerophthalmus—Dry eye.

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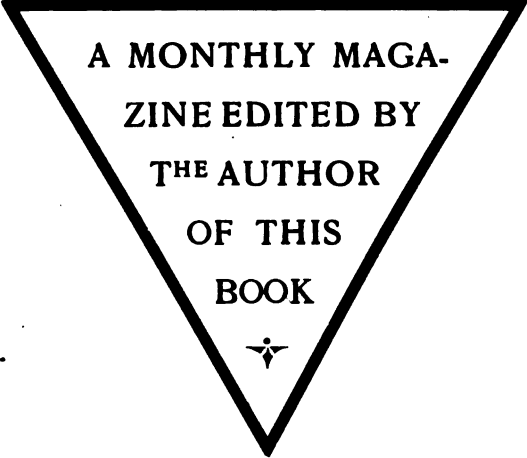
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Now Doctor I can tell you this, that in all my experience in hunting the system that can be depended upon I can find nothing that anything near compares to Dr. McCormick's.

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